

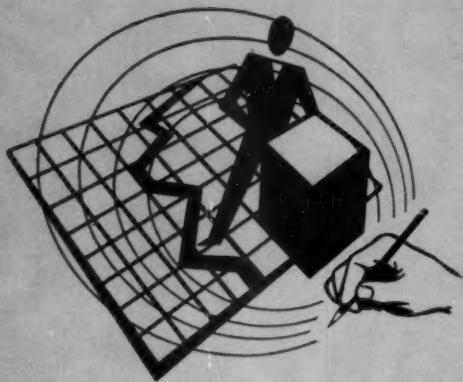
DECEMBER 1955

## MATERIAL HANDLING

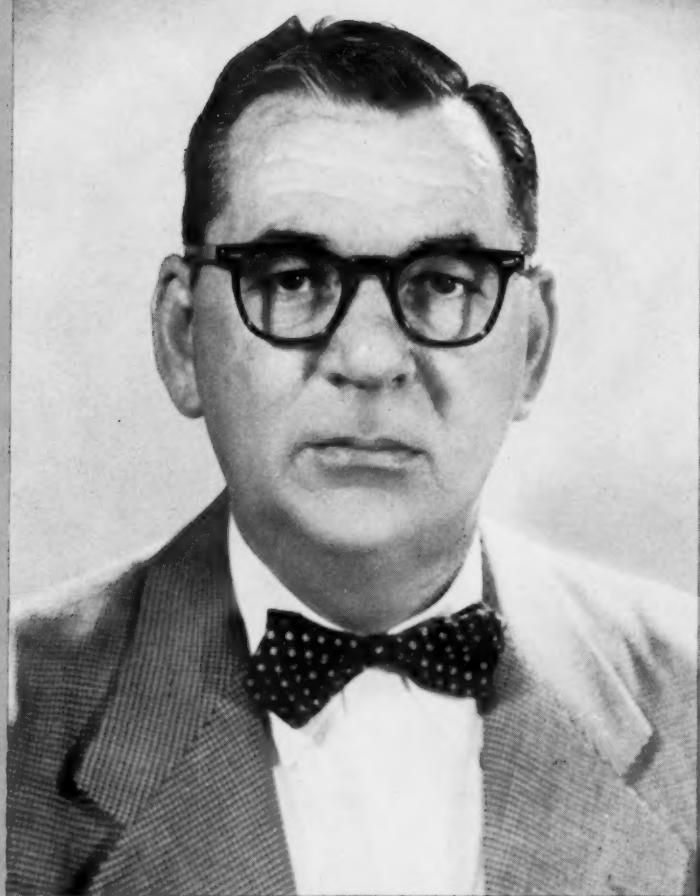
Production • Automation • Packaging • Shipping

### Safety-Engineered Handling

*—Worth Millions  
to Industry*

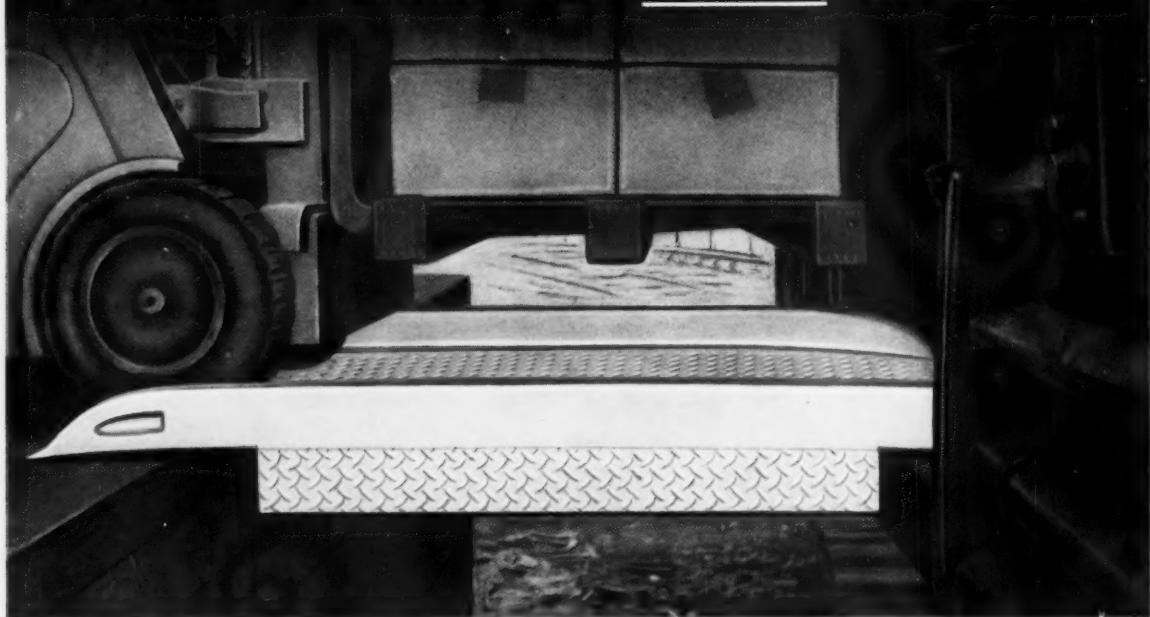


J. W. Hall,  
National President of A.M.H.S.,  
Introduces the topic of the issue with  
Plan Handling to Check Human  
Failures .....page 59



The Inter-relationship of Safety and Material Handling

# PROPERLY SPANNING THIS SMALL DIFFERENCE



## will make a BIG difference in your loading costs!

### You get 10 big advantages with Magliner Dock Boards

- **TIRE-SAVER SAFETY CURBS\***—prevent power truck tire damage.
- **TRIPLE STRENGTH CURB ENDS\***—double tapered for wide-angle turns.
- **RUGGED, PERMANENTLY ATTACHED UNDERSTRUCTURE**—provides automatic, positive position-lock.
- **CROWNED**, so that the edges bear snugly against dock and carrier to accommodate varying differences in height—for smooth, safe equipment crossover.
- **MAGNESIUM LIGHT, STRONG AND SAFE!** For easy one-man handling, maximum safety, economical long-life service.
- **ADDED STRENGTH THROUGH STRESS RELIEVING**—an important extra safety advantage.
- **BEVELED EDGES** (maximum 10° slope)—avoid hazardous load jar—eliminate equipment and load damage.
- **COMFORTABLE, ROOMY HAND GRIPS**—sealed to exclude moisture. Optional full length hand rails for added safety and convenience.
- **SPECIALY DESIGNED, FLUSH-TYPE LIFTING HOOKS**—facilitate moving dock board by power truck over long distances (optional equipment).
- **POSITIVE, ADJUSTABLE DROP LOCK\*\***—the only practical solution for many ramp and dock board installations.

\*Pat. Pend.

\*\*Pat. No. 2659914

This company is getting more work output from power trucks, floor trucks and other loading equipment since they installed a lightweight, low-cost Magliner dock board! With their new Magliner, they can handle more volume on the dock—move more loads in less time—than ever before. Dock traffic now moves faster and smoother . . . loading efficiency has gone up . . . loading costs have gone down!

The new Magliner helps prevent costly accidents—insures greater safety for men, equipment and loads. Made of light, strong magnesium, it can be easily moved and positioned by one man. It will require little or no maintenance throughout its long, useful service life!

Let us prove to you that Magliner dock boards can make a big difference in your loading costs. Write today for the name of the Magline representative in your area, and complete information!

**MagLiner**  
MAGNESIUM

**DOCK BOARDS**

SEND YOUR NAME AND ADDRESS FOR A COPY OF  
BULLETIN DB-204 TO MAGLINE, INC., P.O. BOX 212,  
PINCONNING, MICHIGAN

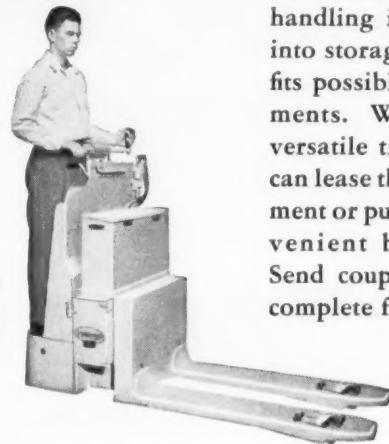
Canadian Factory: Magline of Canada, Ltd., Renfrew, Ontario

Circle No. 100 on Reader Service Card for more information

# TURN AISLE SPACE INTO SAVINGS!



Retractable Mast  
**TRANSVEYOR**  
with fully retractable mast  
saves working space equal  
to length of load.



Low-lift type  
**TRANSVEYOR**  
needs up to 50% less  
aisle space than  
counterweighted  
trucks.



The versatile  
**DOCKER**  
provides efficient heavy  
duty service in cramped  
quarters for a wide variety  
of needs.

MAIL COUPON TODAY  
FOR FULL DETAILS

**Automatic** 141 West 87th Street, Dept. X5  
Chicago 20, Illinois

Please rush me FREE specification folders on Automatic Trucks  
checked below:

RETRACTABLE MAST TRANSVEYOR

DOCKER

Include new data folder on the Automatic "EARN-ITS-OWN-WAY" Plan.

LOW-LIFT TRANSVEYOR

SKYLIFT



The featherweight  
**SKYLIFT**  
...an agile and efficient  
"work horse" where  
space is at a premium.

# A<sup>®</sup> Automatic

WORLD'S LARGEST EXCLUSIVE BUILDER OF  
ELECTRIC-DRIVEN INDUSTRIAL TRUCKS

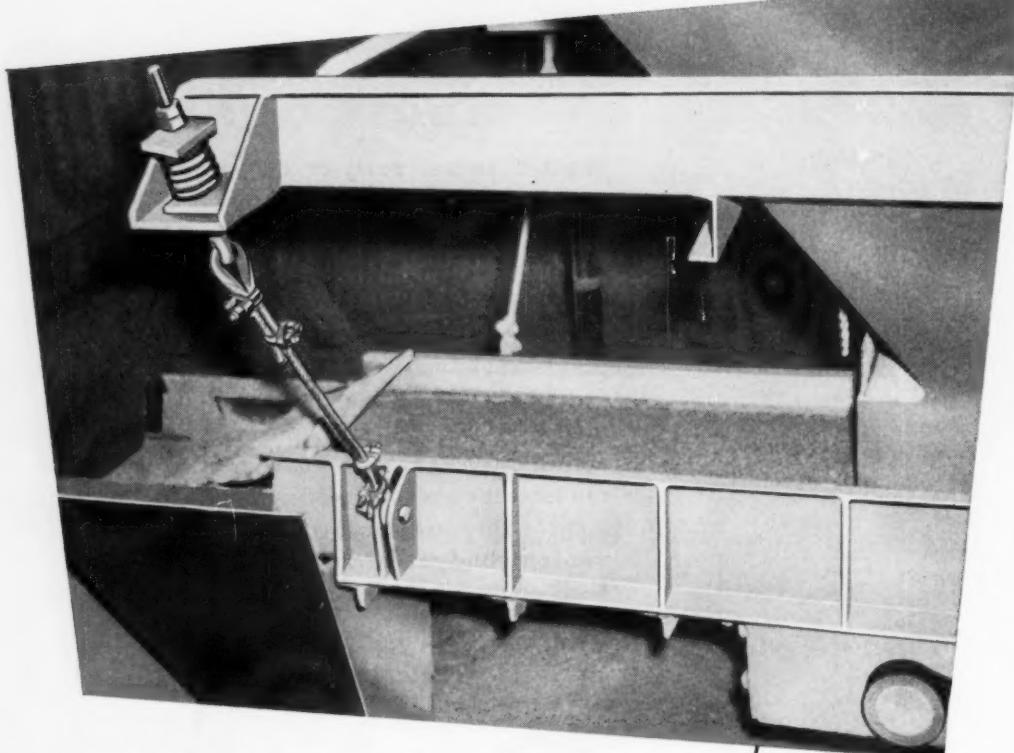
Circle No. 12 on Reader Service Card for more information

DECEMBER, 1955

# SIMPLICITY

## OS-A-VEYOR FEEDER

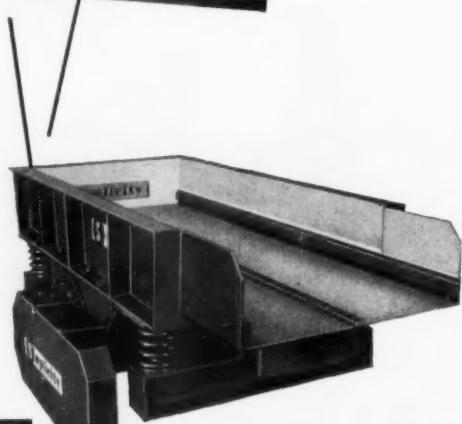
*proves its value in fertilizer plant*



Wisconsin FARMCO SERVICE Cooperative is utilizing this 18" x 6' Simplicity Os-A-Veyor Feeder to feed finished fertilizer from a bin to a bagger. The bagger is operating at 14 bags per minute. The rate of feed is controlled by a gate on the bin.

Simplicity Os-A-Veyor Feeders are designed to handle heavy column loads. They feed along their entire length and allow for the use of a larger bin . . . thus eliminating the problem of material bridging in the bin. Simplicity Feeders may be suspended with spring and cable arrangement from the bin above as shown in the picture, or may be spring mounted. They will feed on the horizontal, as pictured . . . thus requiring less headroom. They feature replaceable liners and can be provided with grizzly or screen sections, one or two decks, and can be totally enclosed. If feeding or conveying problems exist in your plant, call on a Simplicity Sales Engineer and find out about the Simplicity line.

For further information on Os-A-Veyor Feeders, Conveyors, Gyrating Screens and Woven Wire Screen Cloth, write . . .



Pictured here is a 2' x 5'6" Model JA Os-A-Veyor Feeder



ENGINEERING COMPANY • DURAND 5, MICH.

SALES REPRESENTATIVES IN ALL PARTS OF THE U.S.A.  
FOR CANADA: Simplicity Materials Handling Limited, Guelph, Ontario  
FOR EXPORT: Brown and Sites, 50 Church St., New York 7, N. Y.

160-A

Circle No. 131 on Reader Service Card for more information

# Tire Costs Go Down



— with Goodyear Job-Fitted Industrial Tires

Want to get a 3-way benefit of longer tire life, less down time and better dealer service on industrial tires? Then start equipping your industrial trucks with Goodyears. They're job-fitted by tread design, by compound, and by size to deliver more performance with less down time. And you'll find your Goodyear Dealer is tops for fast service on both repairs and replacement orders. Check him and see—this week.

#### Our experts help solve your tough problems FREE

We maintain a staff of fully qualified technical experts to help you solve the tough industrial tire problems in your plant. For our free recommendations, write Goodyear, Industrial Tire Sales, Akron 16, Ohio.

USE THE RIGHT TIRE FOR THE JOB—BUY AND SPECIFY

**GOOD YEAR**  
INDUSTRIAL TIRES

All-Service, All-Weather, Xtra Cushion—T.M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

Circle No. 71 on Reader Service Card for more information

DECEMBER, 1955



Look for this sign; there's a Goodyear dealer near you.

# No More Manual Handling--Anywhere!

## At Last-

a mass produced  
quality machine at low price

for materials handling jobs up to 1,000 lbs.

## Now-

stores, shops, warehouses, post offices, depots, farms, schools, universities, hotels, hospitals, restaurants, service stations, etc. CAN AFFORD one or more battery operated hydraulic lifts.



## More than Ever-

large and small plants alike can economize with fleets of BIG JOE lifts to achieve "hydraulic handling for every department."



COMPARE THE

*Challenger*

FOR QUALITY

FOR PERFORMANCE

FOR PRICE

\$387<sup>50</sup>

THE CHALLENGER is another "In-Between-Handling" Tool originated and developed by BIG JOE. Every BIG JOE lift is guaranteed for quality.



**BIG JOE** MANUFACTURING COMPANY •  
900-08 Jackson Boulevard Chicago 7, Illinois

Circle No. 19 on Reader Service Card for further information

© 1955 Big Joe Mfg. Co.

December, 1955  
Vol. 11, No. 3

## CONTENTS

### DEPARTMENTS

Advertisers' Index .....	170
Association and Society News	48
Calendar of Events .....	40
Catalogs and Bulletins .....	32
Classified Advertising Section .....	168
Equipment and Supplies Section .....	141
Highlights of the Month's News .....	46
Letters to the Editors .....	12
Men in the News .....	54
News From the Sales Field .....	18
News, Views & Trends .....	31
What's New in Useful Literature .....	126



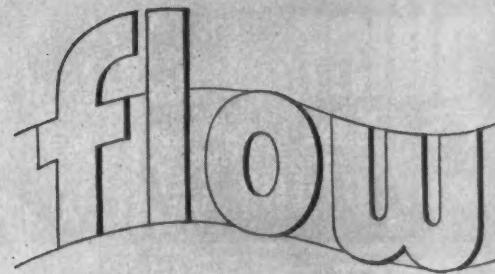
FLOW is published monthly by The Industrial Publishing Group, a Division of Telenews Productions, Inc., 1240 Ontario Street, Cleveland 13, Ohio, which also publishes:

FLOW DIRECTORY  
FLOW'S MATERIAL HANDLING ILLUSTRATED  
PRECISION METAL MOLDING  
APPLIED HYDRAULICS  
INDUSTRY AND WELDING  
WELDING ILLUSTRATED  
OCCUPATIONAL HAZARDS  
COMMERCIAL REFRIGERATION  
AND AIR CONDITIONING

### SUBSCRIPTION RATES

United States and possessions—\$5.00 per year, \$8.00 for 2 years. Subscriptions in the United Kingdom: £2.5 per annum, payable in Sterling at our London Office. Foreign—\$7.00 per year. Canada—\$6.00 per year. Single copies—1-10—\$.50 each, 11-25—\$.40 each, Over 25—\$.35 each. Canada—\$.50 each. Foreign—\$.60 each.

FLOW is indexed regularly by Engineering Index, Inc. "Accepted as Controlled Circulation Publication at Pontiac, Illinois." Please return 5879 forms to 1240 Ontario Street, Cleveland 13, Ohio.



### FEATURES

Plan Handling to Check Human Failures .....	59
The basic handling plan can eliminate accidents despite human errors that are bound to be made.	
How Much Do Handling Accidents Cost? .....	61
The figure may be even higher than we can determine, but it can be cut substantially by analysis and preventive action.	
Safe Handling with Manual Handling Equipment .....	64
Proper design, construction and usage of hand trucks will make possible more efficient—and safer—material handling.	
Substitute Skill for "He-Man" Complex .....	67
Training handlers to admire ability rather than brute strength will pay off in lower costs and fewer compensation claims.	
How to Obtain the most Effective Use of Human Energy .....	70
Highly significant report of research which, probably for the first time, establishes optimal standards for use of manual handling equipment.	
Practical Education for Safety .....	74
An outline of a comprehensive educational program in safety and material handling at General Electric Co.	
Integrating Safety Into Handling Systems for Process and Chemical Operations .....	78
Exhaustive study of material handling methods in industries where hazards are inherent.	
Utility Stresses Safe Yard Storage .....	83
How heavy, awkward materials are safely and efficiently handled at Oklahoma Natural Gas Co.	
Two-Way Radio Serves Safety Three Ways .....	84
Integration of all industrial radio equipment of a plant into a "disaster plan" can pay off in any emergency.	
Foundries Grow Safer, Cleaner as Mechanized Handling Increases .....	87
The modern foundry is a healthier and safer place to work as a result of increasing mechanization in handling.	
Two Million Man-Hours Without a Lost-Time Accident .....	88
The work is hot, heavy and hazardous, but efficient material handling has practically eliminated all lost-time accidents.	

### PACKAGING AND SHIPPING SECTION

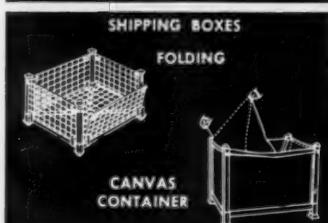
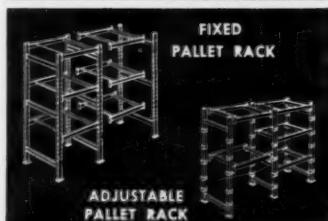
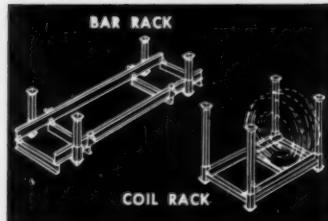
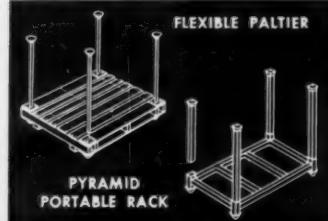
The Safety-Efficiency Ratio in Cargo Handling .....	102
How United Air Lines improved their S-E Ratio	
Product Safety . . . a Function of Packaging .....	104
What causes damage in transit and how to protect against it	
Packaging and Shipping Idea of the Month .....	108
How Fairbanks, Morse & Co. uses corrugated box to protect heavy unit	
Packaging for Automation .....	110
Allen-Bradley Co. keeps pace with automation in electronics	
Simple Carton for Complex Job .....	114
How Viking Air Conditioning solved a tough packaging problem	

Copyright 1955 by The Industrial Publishing Group, a Division of Telenews Productions, Inc.

A **Paltier**  
SYSTEM  
in your plant



## Earns You Money Everyday!

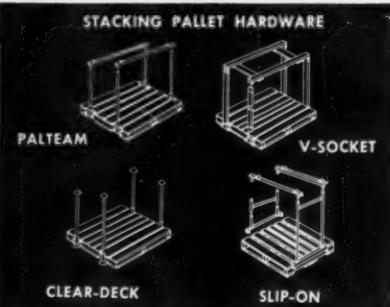


**1** By reducing the area now required to store your inventory, Paltier **EARNS IN RENT MONEY Everyday!**

**2** By reducing the travel time of your men, they handle more merchandise, Paltier **EARNS MONEY In Labor Savings Everyday!**

**3** By preventing damage in crushing, Paltier **EARNS MONEY ORDINARILY LOST Everyday!**

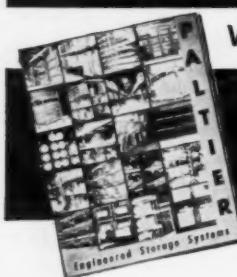
**There is a PALTIER SYSTEM designed especially for YOU**



**Write For FREE Catalog**

**THE PALTIER CORP.**

Designers, Engineers and Manufacturers  
of Engineered Storage Systems



1709 Kentucky Street • Michigan City, Indiana  
DISTRIBUTORS IN PRINCIPAL CITIES

Circle No. 120 on Reader Service Card for more information



### STAFF

President and Publisher  
**IRVING B. HEXTOR**

Executive Vice President  
**LESTER P. AURBACH**

Vice President  
**EDWIN M. JOSEPH**

General Manager  
**RUSSELL F. OAKES**

Editor  
**EDWARD H. LEIGHTEN**

Managing Editor  
**STANLEY S. GREENE**

Packaging & Shipping Editor  
**JOHN D. VELARDO**

Associate Editors  
**MARGARET E. GREENE**  
**ROBERT E. LESSING**

Production Manager  
**WILLIAM L. JERSE**

Art Director  
**ALARIC MAUSSER**

Circulation Director  
**N. G. KISER**

Franchise Department  
**HAROLD F. BEHM, MGR.**  
**HAROLD ROBERTS**  
**ROSS TAYLOR**

### REGIONAL OFFICES

All communications should be addressed to FLOW Magazine, 1240 Ontario Street, Cleveland 13, Ohio.

#### CLEVELAND

**DAVID E. SAWYER**  
1240 Ontario Street  
Cleveland 13, Ohio  
Phone Superior 1-9622

#### NEW YORK

**LEE HAAS, DISTRICT MGR.**  
**NORMAN B. HASSELRIS**  
Room 803, 60 E. 42nd St.  
New York 17, New York  
Phone Murray Hill 7-3420

#### CHICAGO

**CHARLES F. GEYER, DISTRICT MGR.**  
**S. R. TRACY**  
Suite 1613-1615, 520 N. Michigan Ave.  
Chicago 11, Illinois  
Phone Whitehall 3-1655

#### LOS ANGELES

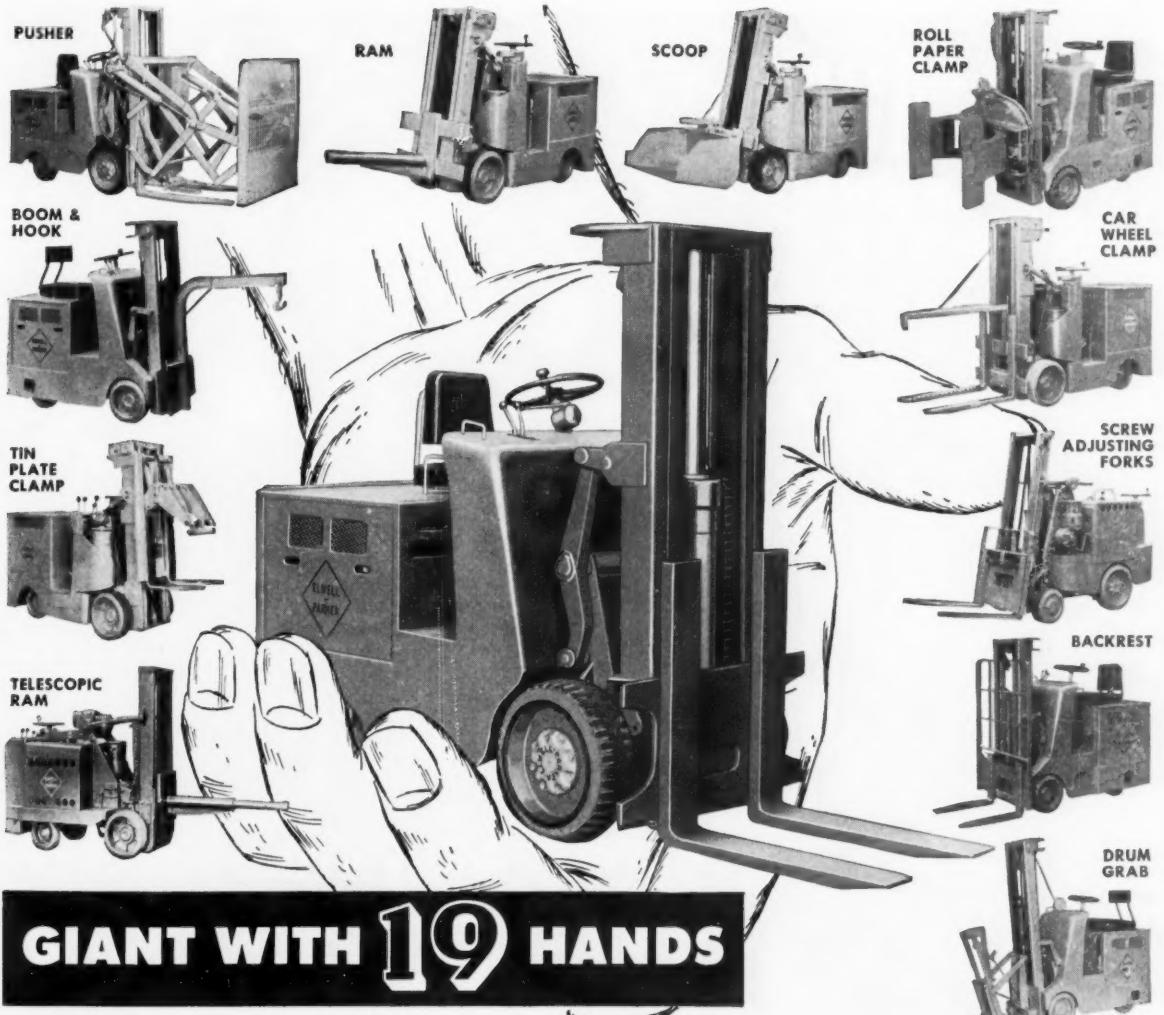
**ALAN CAZIER**  
Room 1003, 3460 Wilshire Blvd.  
Los Angeles 5, Calif.  
Phone DUnkirk 9-9364

#### LONDON

**JOHN A. LANKESTER**  
31 Palace St., Westminster  
London S.W. 1, England  
Phone Victoria 2608

#### TOKYO

**F. C. TAYLOR**  
American Trading Co. (Japan) Ltd.  
No. 1 Shiba Park 7-Gochi  
Minato-Ku, Tokyo



## GIANT WITH 19 HANDS

One Elwell-Parker gives you the strength of a giant—more muscle power than 10 men. And giants' hands could not be more dexterous than the ingenious fork truck with attachments illustrated. They are a product of Elwell-Parker's 45 years' experience, gained while solving scores of unusual handling problems. Truly, Elwell-Parkers can be made to do almost anything but think—our engineers do that! The Elwell-Parker Electric Company, 4291 St. Clair Avenue, Cleveland 3, Ohio.

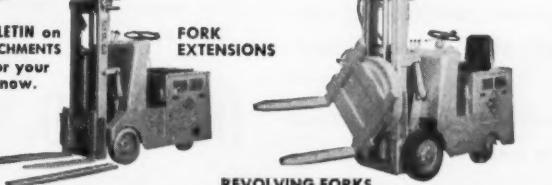
**EIPAR**  
INDUSTRIAL TRUCKS



FREE BULLETIN on  
E-P ATTACHMENTS  
Write for your  
copy now.

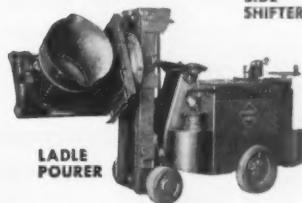


ROLL  
PAPER  
APRON



FORK  
EXTENSIONS

REVOLVING FORKS



SIDE  
SHIFTER

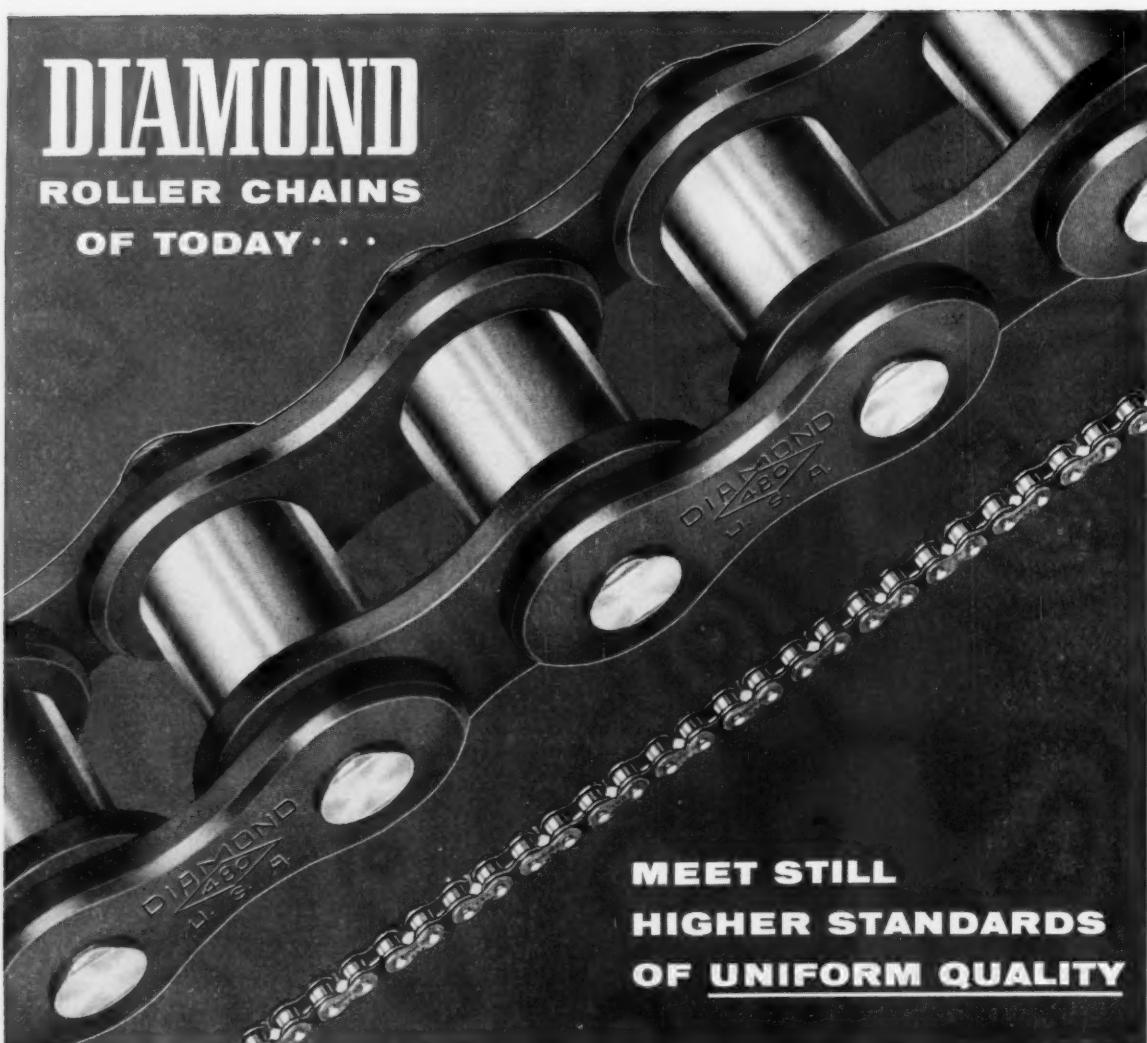


LADLE  
POURER

Circle No. 52 on Reader Service Card for more information

# DIAMOND

## ROLLER CHAINS OF TODAY . . .



**MEET STILL  
HIGHER STANDARDS  
OF UNIFORM QUALITY**

◆ New procedures and methods are always in process at Diamond—research, specialized engineering, experiment and testing, newer heat-treating methods, *preloading, shot-peening*, better raw materials. You get all this and over 65 years of manufacture with skilled craftsmen and most modern equipment, only at Diamond.

This concentration of effort on one product is good reason for the *uniformity* of quality of Diamond Roller Chain, the great reserve strength, the longer life dependability that mean lower cost, improved product and output. The Diamond trade mark is synonymous with highest quality.

In your factory operations, Diamond motor drives hold production speeds at their maxi-

mum, and avoid power and output losses. There is practically no end to the applications of Diamond Roller Chains. Our engineering staff is ready at all times to make practical recommendations.

You will find 64 pages of useful information in Catalog 754. Copy on request.



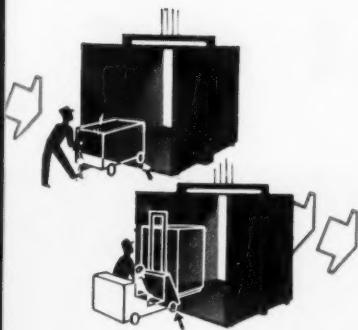
**DIAMOND CHAIN COMPANY, Inc.**

Where High Quality is Traditional  
Dept. 624, 402 Kentucky Ave., Indianapolis 7, Indiana  
Offices and Distributors in all Principal Cities  
Please refer to the classified section of your local telephone directory under the heading CHAINS or CHAINS-ROLLER

**DIAMOND** ROLLER CHAINS

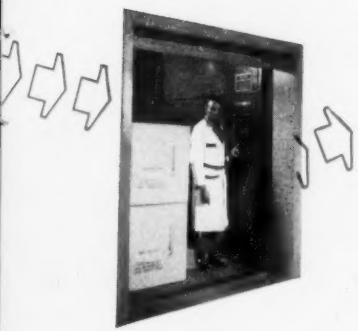
Circle No. 47 on Reader Service Card for more information

## directional arrows



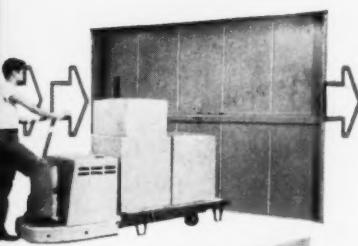
### **power trucks change the picture**

It's necessary to change your thinking about freight elevators when you change from hand truck to power truck loading. A hand truck weighs about 500 pounds. Its relatively small pay loads are pulled into the elevator and distributed by hand. Full car loading is gradual. And the extra weight of the hand truck is unimportant. This type of traffic is easily handled by a conventional freight elevator. However, power truck loading completely changes this picture. A power truck may weigh 8,000 pounds, or more, plus its heavier pay load. It travels fast and stops quickly. Obviously, this type of traffic can be handled safely only in freight elevators and hoistways that have been specifically designed to take power truck "punishment"—as described in detail in Otis Heavy Duty Freight Elevators booklet B-705.



### **easily installed for light freight**

Otis Light Duty freight elevators have a semi self-supporting framework that permits installation in new and existing hoistways without reinforcing the building, or adding overhead supports, or building a penthouse. They can be used for any rise up to 35 feet at a speed of 25 feet per minute with lifting capacities of 1,500, 2,000 and 2,500 pounds. They're described in Otis booklet B-720.



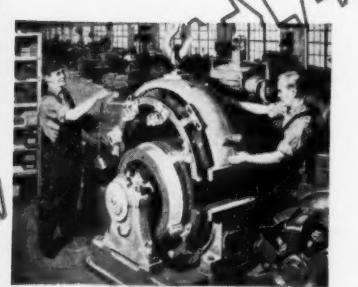
### **protective screen of safety**

Otis engineers have developed a screen of safeguards around freight elevator entrances. A modern Otis freight elevator cannot be started until all car and hoistway doors are closed, and none of them can be opened while the car is moving through the hoistway. Doors can be opened only at a landing where the car is leveling or stopped. Power-operated Otis Hoistway Doors, for new or modernized installations, are described in booklet A-389.



### **freight elevators up-to-date?**

A modern freight elevator is an efficient, safe, production tool for reducing materials handling costs. You can have freight elevators where you want them, when you want them—with or without attendants. Our unmatched experience in all fields of elevating qualifies us to advise on standard use or on special adaptations of Otis freight elevators for completely automatic production lines. This experience is available for any size installation, however large—or small!



### **the heart of the installation**

You can look to your Otis gearless hoisting machine for almost endless service. You'll never wear it out. We'll tell you why. Otis machines are not adaptations of standard commercial equipment. They're specifically designed to meet the unique requirements of elevator service. All parts are built in Otis plants under rigid quality control. Another reason why the Otis trademark is the symbol of the world's finest elevators.

**OTIS ELEVATOR COMPANY**, 260 11th Ave., New York 1, N.Y.  
OFFICES AND SERVICE IN 295 CITIES ACROSS THE U. S. AND CANADA

Circle No. 117 on Reader Service Card for more information

## for MATERIALS HANDLING

Light,  
General  
and  
Heavy Duty  
**FREIGHT  
ELEVATORS**

**DUMBWAITERS**

**HOISTWAY  
DOORS**

**MODERNIZATION**

**MAINTENANCE**

**PASSENGER  
ELEVATORS**

**Otis**

# In a plant or

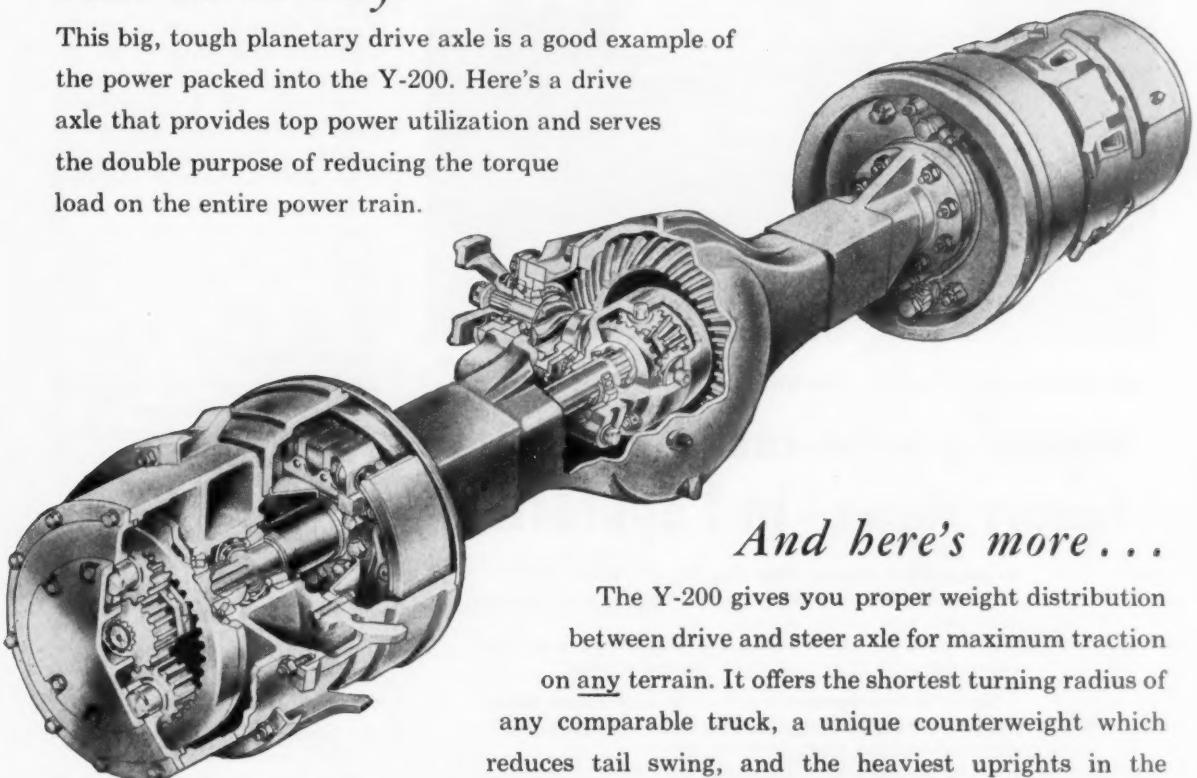


# in a yard . . .

## Clark's Y-200 just doesn't stop!

*And here's why:*

This big, tough planetary drive axle is a good example of the power packed into the Y-200. Here's a drive axle that provides top power utilization and serves the double purpose of reducing the torque load on the entire power train.



*And here's more . . .*

The Y-200 gives you proper weight distribution between drive and steer axle for maximum traction on any terrain. It offers the shortest turning radius of any comparable truck, a unique counterweight which reduces tail swing, and the heaviest uprights in the industry. Your benefit? A truck that will outperform anything in its field. Your local Clark dealer will be happy to supply you with performance details—why not give him a call?



20,000 lbs. of steel press components are rushed from Verson Allsteel Press Company's modern welding plant to their assembly plant. Says Melvin Verson, Executive Assistant, "Big, tough jobs are every day routine in our plant. It's the reason we depend on our Y-200 for handling anything from steel plating to huge press components. It's happened where the material handled is larger than the Y-200, yet we get the same results . . . top efficiency on any assignment."

Industrial Truck Division  
**CLARK EQUIPMENT COMPANY**  
Battle Creek 13, Michigan

**CLARK**  
**EQUIPMENT**

Circle No. 33 on Reader Service Card for more information



How one man with a TENNANT Floor Machine . . .

## shaves grease-caked dirt from factory floors—in 1 operation

As you guide it down an aisle, this big powerful TENNANT Machine does a cleaning job you'll find hard to believe. It outperforms a crew of men.

It combines 3 operations, shaving off thick grease-caked dirt at the rate of 8 to 20 lbs. per minute!

**1. Shaves off thick deposits** from floor by high speed pulverizing action of scarifying cylinder. Cleans 16" path. Works dry—no need for water or detergents.

**2. Smooths and levels surface** by exclusive planing action; doesn't dig or gouge floor. Helps level humps. Leaves good clean surface for fast, safe trucking.

**3. Picks up soilage as it goes.** Hurls traffic-packed dirt and grime into hopper. Does entire cleaning job in 1 operation. Gas or electric models (to 7.3 hp); also 25 hp mobile-type units. Write today for details.

**TENNANT**  
ESTABLISHED 1870

**FLOOR MACHINES**

Circle No. 139 on Reader Service Card for more information



### Soper Article—A Hit

To FLOW:

Thanks for the Soper article in your August issue. You fellows are better than the old serial publishers. You gave us just enough of a hint to make certain that we check the mail daily to get the September issue without delay.

Seriously, the first installment promises a real sound approach to a problem that faces many industrial and commercial concerns. Other approaches . . . have dealt in areas that many material handling people just don't understand or won't take time to figure out. Here, however, is a simple, practical approach that everyone can understand.

I have discussed with other staff members of FLOW, from time to time, a fear that we were not doing a sound job of evaluating actual requirements. Here is a means of determining whether my fears were justified. You can bet I'm going to bring this article to the attention of our entire field group, both staff and dealer.

John R. Titlow  
Lamson Mobilift Corp.

To FLOW:

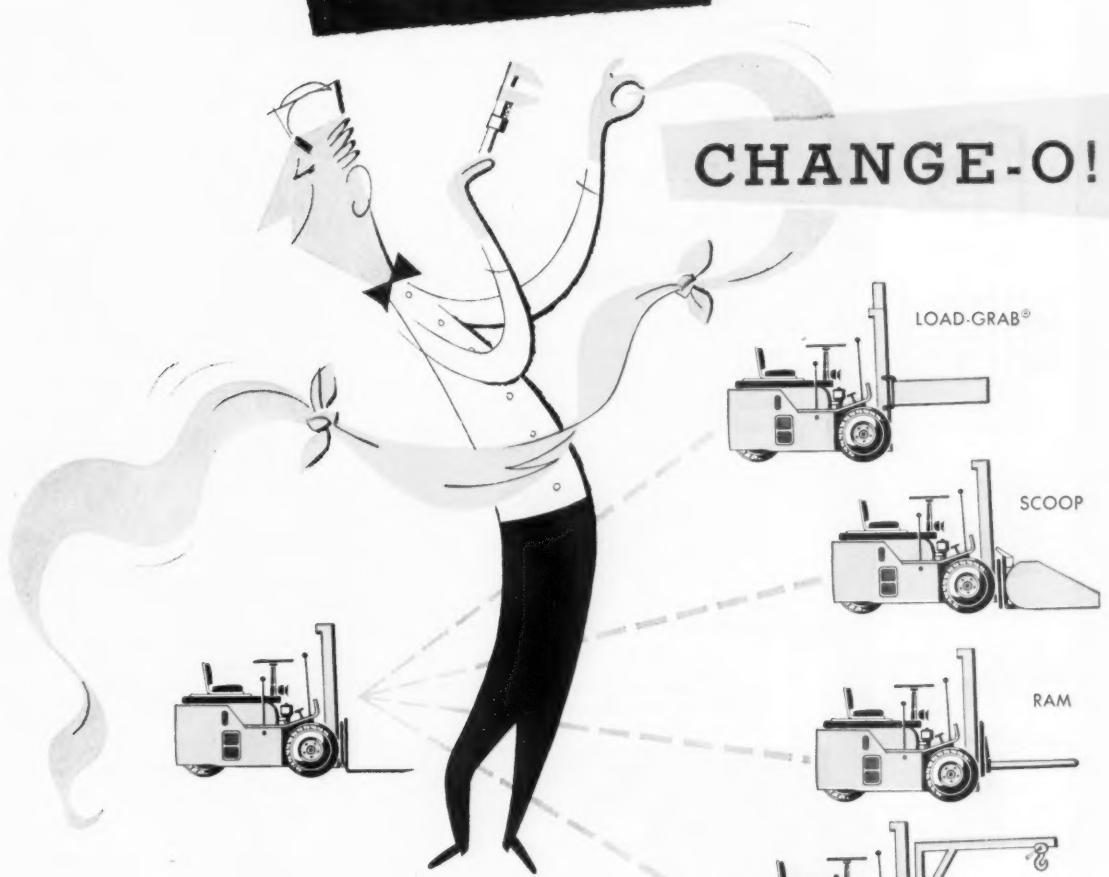
I very much enjoyed the articles on "Measurement of Fork Truck Efficiency" by Forrest W. Soper which appeared as a two-part article in the August and September 1955 issues of FLOW.

We are in the midst of a fork truck utilization survey at our plant and the methods of measurement described by Mr. Soper would seem to be applicable to our equipment.

Thank you very much.

E. F. Heffernan, Jr.  
Remington Arms Company, Inc.  
Ilion, New York

# PRESTO...



## One Hyster® Lift Truck becomes many with the right Job-Attachments!

In minutes, like a magician, your mechanic can remove the forks from the front end of any Hyster pallet-handling fork truck and transform it into a special job-handling truck equipped with the famous Hyster hydraulically-operated Load-Grab clamp, or into a mobile Scoop, Ram, Boom ...or any of more than 100 combinations.

With the right job-attachments *one* Hyster Lift Truck can effectively handle a *variety* of jobs, and *keep busy all day*. You can handle many non-palletized materials, such as bags, bales, bundles, boxes, bottles, cartons, tires, etc., with the right job-attachments. A Hyster Lift Truck is a profit-making investment even for the smallest plant.

Your Hyster Dealer keeps abreast of the materials handling progress in many industries. He will help you select the *right* industrial truck and attachment from Hyster's complete line. You'll find your Hyster Dealer listed in the yellow pages of your telephone directory, under "Trucks-Industrial." Call him today!

### HYSTER COMPANY

2931 N. E. Clackamas Street, Portland 8, Oregon

1031 Myers Street, Danville, Illinois

Hyster N.V., Nijmegen, The Netherlands

#### FOUR FACTORIES:

Portland, Oregon; Danville, Illinois; Peoria, Illinois; Nijmegen, The Netherlands.

MATERIALS HANDLING TRUCKS  
1,000 - 30,000 LBS. CAPACITY



Circle No. 80 on Reader Service Card for more information

DECEMBER, 1955

YOU  
CAN  
STACK  
ANYTHING  
ON..  
**E**  
**M**  
**I**  
RACKS



PORTABLE STOCK RACKS



PALLET RACKS



COIL, REEL  
& DRUM RACKS



BAR STOCK RACKS



DOLLY & TOWING RACKS



COLLAPSIBLE  
& STACKING BOXES

*be a good  
"warehouse-keeper"  
keep your materials*

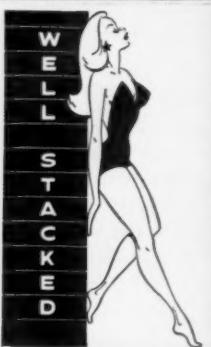
## well stacked!

Equipment Manufacturing storage racks that stack are fabricated of strong, square tubular steel and are adjustable to fit any space or unit load in your plant or warehouse. Special racks designed to your specifications. Field Engineering Service on any installation. Before you decide on a new warehouse, additional storage space or the purchase of stacking equipment, write for our catalog. You save money, space and time with E. M. I. racks.

E. M. I. Pallet Racks increase efficiency in storage and handling at the Cleveland Warehouse of Standard Oil Company of Ohio.



*Write for Catalog ...*



# EQUIPMENT MFG. INC.

21552 HOOVER ROAD • DETROIT 5, MICHIGAN

MATERIALS HANDLING EQUIPMENT

Circle No. 53 on Reader Service Card for more information

STACKING RACKS FOR INDUSTRY

## LETTERS

*Continued*

### To FLOW:

The article by Mr. Forrest W. Soper attracted our particular interest.

I hope similar operation studies of fundamental character will follow from material handling leaders in other fields of activity, so that we come more quickly to the time when the economics of new fork truck installations can be reliably assessed for purchase proposals, etc. to management, in the same way that productions proposals for machine tool automatics have been made for many years.

Needless to add that all here look forward to each new FLOW issue.

John M. Morris  
Coventry Climax Engines Ltd.  
Coventry, England

*The foregoing letters not only told us the Soper article was timely and appreciated, but offered positive proof that FLOW is read "from coast-to-coast and across the seas". Reprints are available.*

### Weighing While Conveying

#### To FLOW:

We refer you to an article in your issue dated April 1955—"Handling Forest Products".

This article shows a belt conveyor scale (poidometer) which records the weight, automatically, of wood chips. For your information, we are manufacturers of soft-board and hardboard made out of waste woods.

We intend to use the above poidometer to weigh the chips which are conveyed from our chipper house to the digester for cooking.

Would you be kind enough to contact the concerned firms with a request to send us further details.

B. Kritchman  
Sefen Ltd.  
Emek Hayarden, Israel

*Information has been forwarded to the FLOW reader in Israel.*

# MOTO-TRUC Instant Power...

...like the "FLICK" of a light switch



MOTO-TRUC offers amazing efficiency with  
**INSTANT ACTION!** (Two speeds, forward  
and reverse.)

This **INSTANT ACTION** transmits power to  
the drive wheel with a minimum of moving  
parts. MOTO-TRUC design "pays off" with  
less maintenance . . . and years of trouble  
free operation.

Remember . . . MOTO-TRUC originated the  
walkie and small rider type trucks . . . and  
**THERE'S A MOTO-TRUC FOR EVERY PUR-  
POSE.** Send for Bulletin No. 53 covering the  
complete line.



The **MOTO-TRUC Co.**

Representatives in Principal Cities

1955 E. 59th St. • Cleveland 3, Ohio  
Pallet... Platform... Hi-Lift Trucks

The Originators of the Walkie and  
Small Rider Type Truck.

Circle No. 110 on Reader Service Card for more information

DECEMBER, 1955

15

## LETTERS

Continued

### HERE'S A BETTER WAY TO... CONVEY LIGHT PRODUCTS!



Freshly packaged cheese sections emerge from automatic packaging machine and are conveyed smoothly and quickly to labelling machine—products received no handling—remain fresh and clean.

WITH

# WENDWAY



Wendway is ideal for conveying fresh-unwrapped meat. Stainless steel belting is recommended.



Cartons or packages ride perfectly on Wendway's smooth, silent belting.

Wendway is the most versatile conveyor in Industry today. With Wendway, you can eliminate the multiple handling of products, save man hours and floor space. You can have remote-controlled efficiency in conveying any light products to any point in your plant. Wendway turns corners, goes up-down in single or multiple tiers—and Wendway's steel wire belting is ideal for handling anything up to approximately twenty pounds per package.

Then too—Wendway does not sag or accumulate oils or dirt like ordinary belting. It can be kept highly sanitary—easily.

But best of all—Wendway will pay for itself in actual savings.

If you have a light package conveying problem—why not use the coupon below or write today for full details on this versatile conveying system.



Gentlemen:

Please send me additional information about Wendway for conveying \_\_\_\_\_.

Name \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

Have a USP Conveyor Engineer contact me at once

**UNION STEEL PRODUCTS COMPANY**  
ALBION, MICHIGAN

Circle No. 150 on Reader Service Card for more information

16-

### There's A Better One

To FLOW:

We are very much interested in the wood pallets illustrated in the article pertaining to jute bales on page 112 of August 1955 issue of FLOW.

The writer would very much appreciate it if you could furnish him with the specifications regarding these pallets and where they might be obtained.

Herbert P. Sontag  
The Firth Carpet Co.  
Auburn, New York

Since we had no data on the particular pallet referred to, we contacted Dolphin Jute Mills. Here is their direct reply to our reader:

Dear Mr. Sontag:

We have received from FLOW a copy of your letter requesting specifications regarding the pallet used in our yarn "Pallet Pack".

The picture of our unit shows the original experimental wood pallet which is no longer being used. We have since developed what we feel is a lighter and stronger one. In fact, it is tailor made for the use intended. From experience we also found that the new pallet is of a better design for stocking purposes.

Attached is a sketch of this new wood pallet. As far as we know, no one is making this style commercially. We buy all the lumber pre-cut and assemble it in our own carpenter shop. Costwise, these pallets come to approximately \$1.60 - \$1.70 per unit.

In addition to supplying you with the attached sketch, should you feel it will be to your advantage to have one of these in assembled form, we will be happy to have one sent to you.

Should there be any further information you would like relative to this unit, please feel free to call on us.

Edward E. Wild  
Dolphin Jute Mills  
Paterson, New Jersey

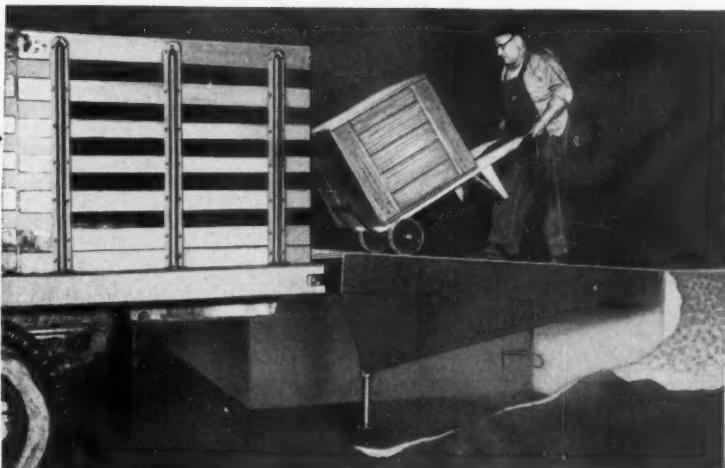
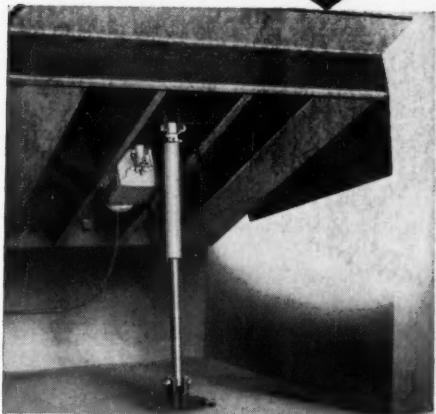
FLOW

# NEW! Versatile...Easily Installed!

## GLOBE TRANS-O-MATIC RAMPS

To speed loading and cut handling costs, Globe's new Trans-O-Matic Ramps bring dock level to truck bed level with fast push-button control. Platform measures 6' x 8' 4" including 14" all steel lip.

Sturdy hydraulic jack is operated by power "package" consisting of motor, pump, reservoir and valves. Entire mechanism is weather-protected and snugly mounted between supporting box members for extra protection.



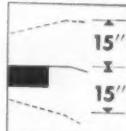
### MULTIPLE SAVINGS—INCREASED DOCK CAPACITY

Truck loading and unloading is smooth and safe... costly rehandling of goods is eliminated... when Globe Trans-O-Matic Ramps go into action on your loading dock.

Because goods move swiftly across platform without interruptions, your present dock area can handle two or three times more freight. Material handling costs are substantially reduced.

### 25% GREATER RANGE

Lip of steel ramp moves 15" up or down from horizontal to provide full 30" travel. Ramp "floats" with rising or lowering action of truck or trailer floor. Unique lip design provides smooth roll-over.



### NO EXCAVATION OR PIPING

Entire Trans-O-Matic mechanism is *above ground*, permitting quick, low-cost installation. If need be, complete ramp can be easily moved and relocated without loss.

### BOX CONSTRUCTION PROVIDES EXTRA RIGIDITY

Two parallel box members, of  $\frac{1}{4}$ " steel plate, reinforce ramp and provide added strength without weight. Ramp sustains roll-over weight of 20,000 lbs., and storage loads up to 400 lbs. per sq. ft.

## GLOBE TRANS-O-MATIC RAMPS

PLANTS: DES MOINES—PHILADELPHIA—LONG BEACH, CALIF.



*Clip today  
for free copy*

GLOBE HOIST COMPANY  
East Mermaid Lane at Queen Street  
Philadelphia 18, Pennsylvania

F-720-TR

Please send me more information on Globe Trans-O-Matic Ramps together with FREE booklet "Case Studies in Modern Lifting."

NAME \_\_\_\_\_

COMPANY \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_

Circle No. 68 on Reader Service Card for more information

DECEMBER, 1955



## Use UNIT with SAFETY

Lifting heavy loads, like this unwieldy 78 foot steel beam, is an easy operation for a UNIT Model 1020 Crane. The LIFT and CONTROL ability of UNIT permits loading and unloading with speed and accuracy.

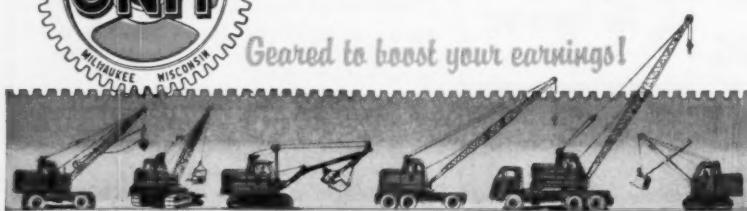
The Safety-promoting FULL VISION CAB enables the operator to see what he is doing at all times. If you have a material handling job that must be performed quickly, efficiently and with SAFETY . . . look into UNIT.

*Send for Bulletin Now*



**UNIT CRANE & SHOVEL CORP.**  
6531 W. Burnham St. • Milwaukee 14, Wis., U.S.A.

*Geared to boost your earnings!*



A 8484-3-C

Circle No. 151 on Reader Service Card for more information

**news from the  
SALES FIELD**

Most recent addition to the sales staff of **M. E. Canfield Company**, southern California distributor of material handling equipment, is **Paul M. Fletcher**.

He holds a degree in mechanical industrial engineering, and has held a number of responsible positions in engineering. He will offer industrial firms assistance on time study, product flow methods and material handling.



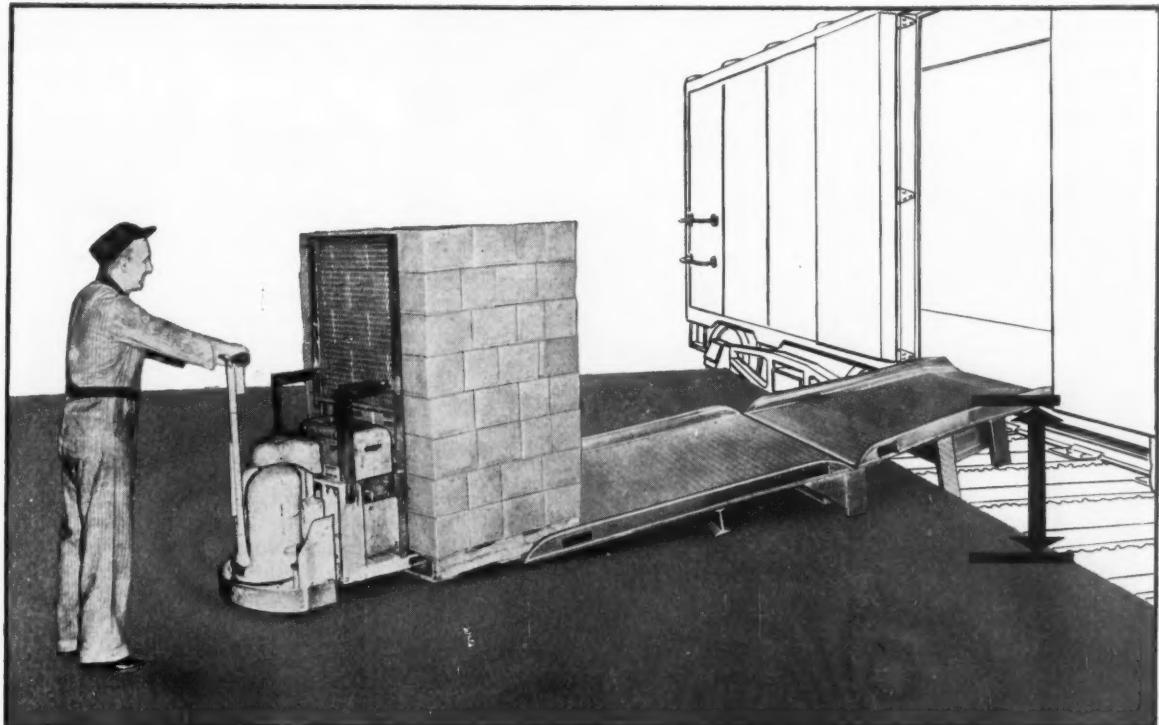
**P. M. Fletcher** is the New Memphis, Tennessee representative of **Lewis-Sheppard Products, Inc.** William C. Wepfer, 640 Harvey Rd. Wepfer's firm is equipped with complete sales and service facilities.

The Steel Strapping Division of **The Stanley Works** has appointed two new sales representatives. **Frederic C. Faulkner** will cover part of the state of Connecticut and **Milton T. Craig, Jr.** will represent the firm in Rhode Island and southeastern Massachusetts.

The Grady W. Jones Co. of Nashville, Inc. has changed its name to **The Bailey Company, Inc.** The firm will continue to maintain sales offices in Nashville and Chattanooga and will open an office in Knoxville at an early date, according to company president **James Bailey**.

**Syracuse Supply Co.**, 294 Ainsley Drive, Syracuse, New York, is the new **Bucyrus-Erie Co.** distributor for central New York.

*(Continued on page 20)*



Magcoa Ramp-Dockboard with angle curbing solves two vexing reefer car loading problems: height differential and narrow door-opening.

## Solve low-rail-dock and narrow-door problems with Magcoa Magnesium Ramp-Dockboards

You know this problem: What to do when your dock is considerably lower than the floor of certain railroad cars, especially refrigerator cars? It's a common problem.

Your local Magcoa Representative can help you solve it by furnishing a Ramp-Dockboard Combination which converts the height difference into a long, smooth grade. No chance for even low-under-clearance pallet trucks to get stuck.

Each section—the Ramp and the Dockboard—can be moved and positioned by one man. A long, one-piece board would have been difficult to handle. A short unit would have resulted in too steep a grade, with resulting underclearance problems. This way—the Magcoa way—your low-dock, high-car loading problem is solved easily . . . and safely.

When the height difference is less than the height of the Ramp, the Dockboard can be used alone.

**Solves The Narrow-Door Problem, Too**—This, too, used to be a major problem: how to get a low-lift pallet truck with a maximum-width pallet load through the narrow door-opening of a refrigerator car. (See Fig. 1). The low-lift trucks could not raise the pallets high enough to clear the quarter-round safety curbs. Magcoa solves the problem by using angle curbing at the car-end of the Dock-



Fig. 1



Fig. 2

board. (See Fig. 2). This satisfies both the underclearance and side-clearance requirements; permits maximum safe use of the refrigerator car door opening. Exclusive Magcoa quarter-round safety curbing is used for the balance of the curb.

**Light-weight, Heavy-duty Magnesium**—Every Magcoa Dockboard is constructed of magnesium, the lightest of structural metals. Every Magcoa Dockboard has the patented hand holds and other safety features which have made Magcoa Dockboards famous.

**Other Loading Problems?** As illustrated by the case above, it's standard procedure for Magcoa Representatives to approach the *whole* problem . . . and to help you get equipment which solves the *whole* problem, not merely one part of it.

**What's Your Loading Problem?** Are you bothered by a low rail dock? A low truck dock? A narrow, congested dock? Inefficient loading from

ground level? Spilling or damaging loads? Planning the dock for a new plant or warehouse? Modernizing an old dock? Switching to higher-capacity lift trucks or pallet trucks?

Whatever the loading problem, the odds are 1000 to 1 that your local Magcoa Representative has encountered it and solved it before.

**A Suggestion:** Send for our free new bulletin, "What to do about Difficult Docks." It's loaded with practical, helpful ideas.

## MAGNESIUM COMPANY OF AMERICA

MATERIALS HANDLING DIV.  
EAST CHICAGO 1, INDIANA

Representatives in principal cities



IN CANADA—Magcoa Limited,  
277 Kipling Ave., South  
Toronto 14, Ontario

Please send "Difficult Docks" bulletin

Name and Title \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City-Zone-State \_\_\_\_\_

Copyright, 1955, Magnesium Company of America.

Circle No. 101 on Reader Service Card for more information

DECEMBER, 1955



## **new Baker SHOVELoader**

### **saves up to \$400 on initial cost**

Now you can mechanize your bulk handling operations for less than \$10.00 per day for one year . . . much less than you pay a laborer with a hand shovel!

This rugged Model 20 SHOVELoader has a lifting capacity of 1500 pounds, and lifting height of 7 feet. Standard bucket size is 12 cubic feet. Loader arms are in front of operator—not around him—protecting him from injury and providing full 360° visibility at all times.

Four forward speeds with top travel speed of 14 MPH make this a fast machine and insure better operation on ramps and rough ground conditions.

Bucket tilt-back at ground level means a full load at every grab, and permits low carrying position for travel. Other advantages are longer forward reach, greater longitudinal stability, extremely low maintenance because of easy accessibility of all parts requiring service, and design of the husky, trial-proven engine.

Special attachments are available for special jobs—forks for palletized loads, crane hooks for hoisting, and special buckets for dense materials. Catalytic exhaust system is available for inside work, where required.

Compare these and SHOVELoader's many other features with loaders costing \$350 to \$400 more! Write for complete information. The Baker-Raulang Company, 1219 W. 80th St., Cleveland 2, Ohio.

**Baker**  
**HANDLING EQUIPMENT**

Circle No. 17 on Reader Service Card for more information

## **SALES FIELD**

*Continued*

Stanley R. Bryant has been named field sales manager of The Raymond Corporation. From 1942 to 1947 he served Raymond in various capacities including sales manager, and returns to the company. S. R. Bryant after eight years of sales work with the Chicago representative. In his present position, Bryant will recruit, train and work with sales representatives throughout the United States and Canada.



Five new sales appointments have been made known by Robert Gair Company, Inc. Named as sales managers were Harvey Hearl, J. O. Pedersen and Richard W. Lindquist, who will be responsible for Frozen Food Packaging, the Chicago ACM Division, and soft drink carriers respectively. O. R. Gibbons was appointed assistant to eastern sales manager Wray H. Callaghan, with headquarters in New York, and Charles M. Hayes will assist C. A. Colbert, western sales manager headquartered in Chicago.

M-H Equipment Company, Inc. has appointed W. L. "Bill" Hutton sales manager. In addition to other responsibilities, Hutton will assist in the development and marketing of a line of industrial hand trucks. Most recently he was sales manager of Thomas Truck & Caster Company, prior to which time he was president of Hutton Wheel Corp.

The Alvey-Ferguson Company has appointed J. H. Overpeck Company its distributor in Pittsburgh. The firm is located at 1112 House Bldg.

*(Continued on page 22)*



# WRIGHT Electric Hoists for Top Production, Easiest Maintenance

**WRIGHT** Speedway Electric Hoists—Frame 1, Frame 2 and Frame 3—are ideal **HOISTS** for handling production materials where the load requirements **ARE** from  $\frac{1}{4}$  ton to 10 ton capacity. Their design includes many advanced **SAFE** operating features. Sound choice of components provides them with **EFFICIENT** balance for smooth running. Parts are designed and built to give **RUGGED** performance with a minimum of care. Plant operating men find them **ADAPTABLE** to almost every type of shop work because of the wide range of speeds, lifts and mountings.

*The more particular you are in your selection of hoisting equipment—the more likely you are to choose WRIGHT*

Write our York, Pa., office for any or all of these fully informative bulletins—

Bulletin DH-133B on Frame 1 and 1½ WRIGHT Speedways

Catalog E-54A on Frame 2 and 3 WRIGHT Speedways

Bulletin DH-504 on WRIGHT Electric Roller Chain Hoist

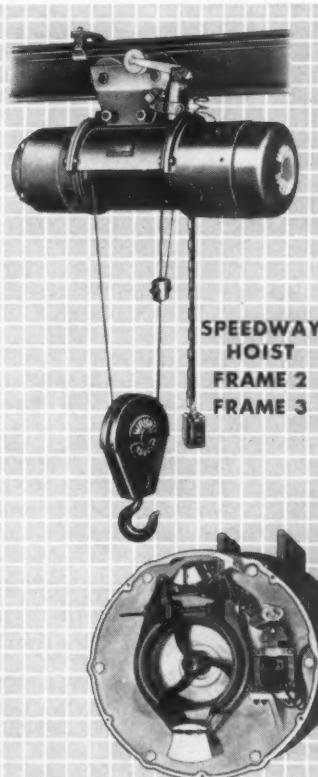


## Wright Hoist Division AMERICAN CHAIN & CABLE

York, Pa., Atlanta, Chicago, Denver, Detroit, Los Angeles, New York,  
Philadelphia, Pittsburgh, San Francisco, Bridgeport, Conn.

Circle No. 4 on Reader Service Card

for  
Better  
Value



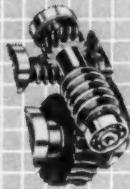
MOTOR BRAKE & SOLENOID  
FRAME 2 and FRAME 3 HOIST  
"Nothing to adjust but the cam!"



### WRIGHT Electric Roller Chain Hoist

- $\frac{1}{4}$ ,  $\frac{1}{2}$ , 1 and 2-ton capacities
- Fewest number of wearing parts
- Self-locking, double-worm gear acts as own load brake
- Spring-set, shoe-type motor brake, clam shell type
- Oversize precision ball bearings
- Forged steel-alloy hook, swings and swivels

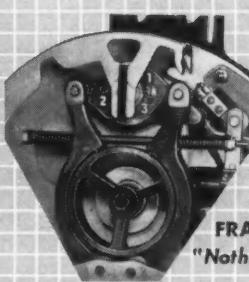
COMPETITIVELY PRICED



THIS DOUBLE-WORM GEAR  
ELIMINATES TROUBLESOME  
LOAD BRAKES



SPEEDWAY  
HOIST  
FRAME 1  
(also FRAME 1½)



MOTOR BRAKE  
FRAME 1 and FRAME 1½  
"Nothing to adjust but the cam!"



## SENSATIONAL *Laher* ELECTRICS

Hill-Billy Delivery, Model 7

**America's finest and only complete  
line of electric vehicles**

More and more buyers of Material Handling equipment are finding these outstanding Laher Electric vehicles are exactly what they need for economical light and medium hauling jobs, personnel carriers, shop and repair cars and thousands of other uses — around factories, warehouses, docks, refineries, airports, hotels, hospitals and dozens of other industrial and farm operations.

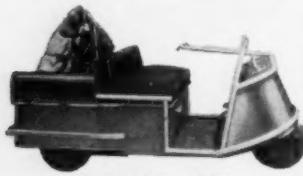
### AMERICA'S ONLY COMPLETE LINE OF ELECTRIC CARS



Hill-Billy Deluxe Shopper



Hill-Billy 3-Pas. Deluxe Personnel Carrier



Hill-Billy Deluxe Golfer



Laher Special Rental Golfer



Laher Special Per. Carrier and Shop Car

### COMPARE THESE OUTSTANDING FEATURES

- ◆ Laher Electrics cost only 5-15¢ per day to operate.
- ◆ The only Electric with six powerful (190 AMPERE each) batteries — greater amperage means more miles without recharging — greater climbing capacity; just as more gas in a car means more miles.
- ◆ The only Electric with all the equipment on an AUTOMOBILE-TYPE DASHBOARD — HAND BRAKE — LOCK — FORWARD and REVERSE SWITCH — AMPERE — and CHARGING SOCKET!
- ◆ The only Electric car made with full ELLIPTIC SPRINGS BOTH FRONT AND REAR.
- ◆ The only car with CHROME ALLOY SPRING STEEL BUMPS — FRONT, REAR, AND SIDES — CADMIUM PLATED.
- ◆ The only Electric with a choice of LAHER TURBO BELT DRIVE OR DOUBLE SPROCKET CHAIN.
- ◆ Charges overnight — use 110 circuit.
- ◆ WELDED CHANNEL STEEL FRAME — no tubing, etc.
- ◆ AUTOMOTIVE TYPE DIFFERENTIAL, EQUIPPED THROUGH-OUT WITH TIMKEN ROLLER BEARINGS.
- ◆ 2 brake controls — separate FOOT and AUTO HAND EMERGENCY BRAKE ON DASH.
- ◆ DEEP AIR FOAM SEAT CUSHIONS — FINEST MADE BY MAJOR RUBBER CO. — most comfortable of any car.
- ◆ Only electric car manufactured by large maker of auto parts and equipment, with world-wide distribution.
- ◆ SPECIAL ORDER VEHICLES CAN BE MADE TO YOUR SPECIFICATIONS — Submit your requirements.

Write today for complete information—

**LAHER MUSTANG MFG. CO., INC.**

Subsidiary of Laher Spring & Tire Corp.  
Makers of Quality Automotive Equipment  
for over 40 years.

2615 Magnolia Street, Oakland, California  
300 Madison Avenue, Memphis, Tennessee



Circle No. 91 on Reader Service Card for further information

### SALES FIELD

*Continued*

Clement N. Williams has joined Lewis-Shepard Products, Inc. as assistant sales manager. He was associated with Clark Equipment Company since 1947, and was C. N. Williams New England sales manager for the past five years. He attended the University of Pennsylvania and the Wharton School of Business.



Two new California dealers have been appointed by the Industrial Truck Division of Clark Equipment Company, J. R. Rolfe Equipment Company, 3200 J St., Sacramento, is headed by Jeane R. Rolfe who has been with Clark for eight years, most recently as a sales representative in New York City. Warner-Yates Company, 1441 Terminal Ave., San Jose, was organized by Vance R. Warner and Robert Yates. Both firms will offer sales and service in exclusively franchised areas.

Three material handling engineers were recently singled out by Pittsburgh Steel Products Co. to cover important marketing areas. John Paul Bourbeau was assigned the New York territory, Robert K. Lohman was named to handle sales in 11 Midwestern states from headquarters in Chicago, and Russel H. Nutter was appointed to cover Michigan and Toledo, Ohio, with headquarters in Detroit.

American Sisalkraft Corporation has transferred Don Dolfie to the Chicago mid-west district sales office where he will specialize in industrial sales work. Succeeding him as field sales representative in the western Pennsylvania and

*(Continued on page 24)*

The story of (2) companies  
with (2) different  
material handling  
problems and how they  
solved them  
with (2) different

# LORAIN CRANES

In the yards of each of these two well-known public utility companies, you will see a Lorain Crane boom reaching skyward. The booms may look quite similar, but the jobs the Lorains are doing and the types of mountings are quite different. That's because the material handling problems of each of these plants involve different types of material and travel requirements. However, both The Detroit Edison Co. of Detroit, Michigan, and the Toledo Edison Co. of Toledo, Ohio, found the answer in the cost-cutting, time-saving performance of a Lorain Crane.

At The Detroit Edison Co., materials to be handled involved warehouse supplies and parts; Toledo Edison required a machine to handle bulk materials. In one case, mobility to move quickly around the sprawling plant was needed and to fill this need, The Detroit Edison selected a 17½-ton rubber-tire Self-Propelled Lorain Crane, model SP-254W. On the bulk material handling job, rough terrain was more of a factor than constant mobility. So, Toledo Edison selected a Lorain-50 crawler machine.



**THE DETROIT EDISON CO.**—This 17½-ton Self-Propelled Lorain Crane, model SP-254W, handles a wide range of materials at their River Rouge plant, unloading and stocking warehouse items such as valves, pipe, cable conduit, generators, motors, etc. It is shown lifting a deaerating unit for a feedwater make-up system.

Here are two companies in the same industry, each with a different kind of material handling problem . . . both solved by a Lorain. This is typical of the wide range of applications and versatility of Lorains to any industry wherever materials of any kind must be handled. It is typical, too, of the selection offered in the Lorain line. There are mobile cranes on rubber tires from 6 to 45-ton capacities . . . cranes on crawlers up to 61 tons. And you can equip your Lorain with 16 or more attachments to handle any size, type or shape material. Get a Lorain. They can handle more materials, faster, at less cost.

*Why don't you get all the facts on applications and Lorain features from your Thew-Lorain Distributor . . . today.*



**TOLEDO EDISON CO.**—Here a 1-yard crawler-mounted Lorain-50 Clamshell cleans out a catch basin of cinders and heavy fly ash. The Lorain is also used to unload chlorine from incoming cars. Toledo Edison officials report, "This crane is an excellent piece of machinery, best machine of its type made. Very efficient, the upkeep is very low."

**Send For Free Booklet . . .** "Planning Yard Handling with Mobile Cranes" by W. C. Garrett, Plant Engineer of The Thew Shovel Co.—written by and for material handling men. Be sure to get your copy—write to . . .

**THE THEW SHOVEL CO., LORAIN, OHIO**

**THEW LORAIN®**

Circle No. 141 on Reader Service Card for more information

DECEMBER, 1955



COURTESY ESSO, BATON ROUGE, LA.

**Use fewer RACKS...  
save 30% floor space and labor!**

**with TRULY ADJUSTABLE  
BOLTLSS SHELF  
PALLET RACKS\***

Rack "Pallet Racks"—featuring truly adjustable boltless shelves makes possible neat, orderly and economical rack installations as shown above. Note the elimination of wasted space! The boltless shelf on 4" centers permits fast, safe changing of shelf openings to suit height of pallet load. Welded uprights can be spaced for any size shelf, and a 10 ton capacity unit can be erected by your own men in 20 minutes or less. Rack engineers will gladly show you how. Write us today.

\* Patented in U.S. and foreign countries

*Send for complete data!*

**RACK  
ENGINEERING COMPANY**

131 SIXTH STREET

CONNELLSVILLE, PA.

Distributors in Principal Cities

Plants: Connellsville, Pa.; Gardena, Calif.; Farnham, Canada; Slough, England  
Circle No. 121 on Reader Service Card for more information

**SALES FIELD**

*Continued*

West Virginia areas is James S. Hoover.

The Buda Division of Allis-Chalmers Manufacturing Company has appointed George L. Langill as district representative for the whole of New England as well as Quebec, Canada. Langill's experience covers all phases of fork truck and tractor sales and service. He will headquartered in Wakefield, Mass.

Appointment of Harold A. Rich as distributor for Du Mont mobile radio equipment in the Philadelphia metropolitan area and the states of Maryland and Delaware was announced by C. J. Harrison, sales manager for mobile communications. Allen B. Du Mont Laboratories, Inc. Rich will maintain offices in Gradyville, Pa., a suburb of Philadelphia.

Recently named as eastern division sales manager of Bags and Paper for the Southern Kraft Division of International Paper Company was A. Siegel, who joined the company in 1925. Since 1935, Siegel has served as assistant sales manager of the Southern Kraft Division in charge of all paper products, and he is succeeded in that position by Hugh B. Vergara.

A four story building located at 206-08 South Front Street has been purchased by the H. G. Hanline Company of Philadelphia. The move was said to be necessary due to an increase in the firm's stitching wire and box strapping business, and also their recent purchase of the U.S. rights, title, trade-mark, patents and formulae of the Alpha and Opalac marking and stenciling inks from Binney and Smith Company.



ACKERMANN  
**BAND-BOX**  
PATENT APPLIED FOR  
SHIPPING CONTAINER

**Re-usable, Steel  
Shipping Container**

**SHIPS**  
**STACKS**  
**STORES**  
**BANDS**  
**NESTS**  
**PALLETIZES**

Ackermann BAND-BOX gives full protection to contents in storage and in transit.

*easily, efficiently, economically!*

Here's the practical solution to your inter-plant shipping and storage problems...the new Ackermann BAND-BOX. Feature for feature, there's just no other shipping container that can compare to it.

Light weight but rugged. Space necessary for storage when not in use is greatly reduced. No repair expense because spare parts are less expensive than labor. Engineered to your exact needs. Write, wire or call today.



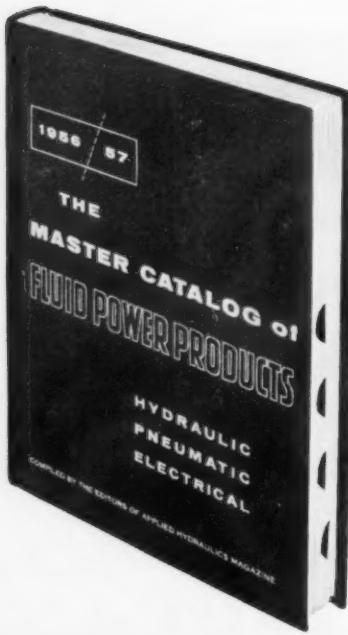
**ACKERMANN MANUFACTURING COMPANY**

WHEELING • WEST VIRGINIA

Circle No. 1 on Reader Service Card for more information

DECEMBER, 1955

# NOW AVAILABLE



## The MASTER CATALOG of Fluid Power Products

**ORDER YOUR COPY TODAY**

A MASTER REFERENCE FILE in a handsome hard cover bound single volume, thumb notch indexed for easy reference. A reference manual of infinite value to designers, engineers and specialists in fluid power application and operation, covering hydraulics, pneumatics and electrical controls.

**Alphabetical Index of Products and Manufacturers.** Every manufacturer is listed under each product or service he makes or renders, with full addresses and cross references to Catalog page numbers.

**Catalog Index Manufacturers Outlets.** Catalog sheets with Special emphasis on specification and user data. A complete index to catalogs PLUS a list of all sales outlets—branch offices, field engineers, dealers and distributors. The first reference of this kind available to the Fluid Power field. The section is thumb-notch indexed for quick reference.

**Trade Names.** This section enables a buyer to locate a manufacturer and his specification sheets, if he knows the trade mark. Thumb-notch indexed for easy reference.

**Engineering and Technical Data Section.** This valuable section is edited with the practical requirements in mind of the designer, application and operating personnel in the major industries using fluid power circuits. A section on Basic Data includes specimen pneumatic, hydraulic and electrical diagrams; Fluid Power Circuits; pipe and tubing selection tables; charts of hydraulic fluid characteristics; graphic solution charts and fundamental formulae for selecting components and building circuits, etc.

There are separate sections covering major components of hydraulic and pneumatic circuits—pumps, valves, cylinders, packing and fluids, as well as control units and accessories.

*A separate Table of Contents for the Engineering and Technical Data Section is designed to make this data of maximum usefulness. Thumb-notch indexed.*

**"Where to Buy Locally"** A local buyer's guide or "yellow pages" type of listing of independent outlets, dealers and distributors, listed alphabetically by city and state. Properly arranged and indexed, the prospective buyers can identify their local source of procurement with minimum of motion.

**\$6.50**  
Per volume

**Order Your Copy Today**

THE MASTER CATALOG OF  
FLUID POWER PRODUCTS  
1240 ONTARIO ST., CLEVELAND 13, OHIO

Send me a copy of the 1956  
MASTER CATALOG OF FLUID POWER PRODUCTS as soon  
as it is available.

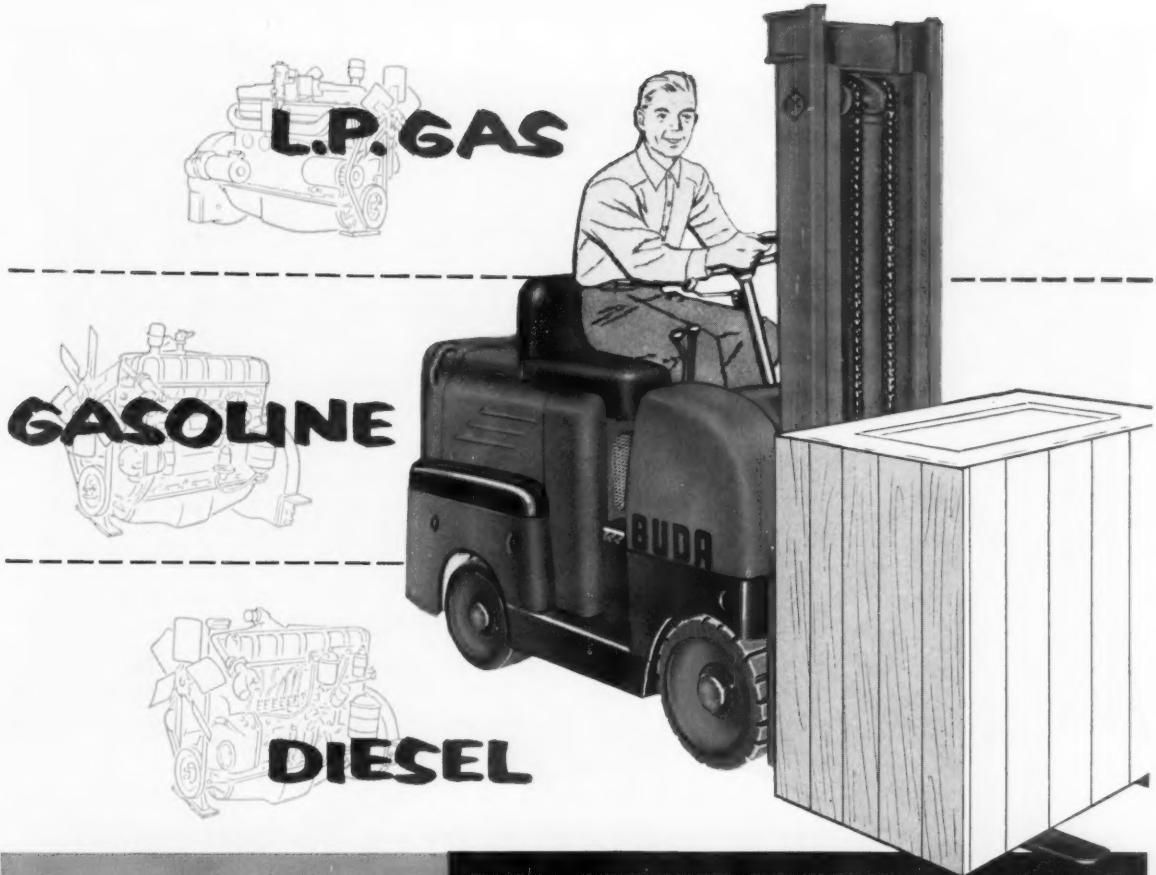
Enclosed is \$6.50       Bill me (Order No. ....)

Name .....  
Street .....  
City ..... State .....

Compiled and Published by

**APPLIED HYDRAULICS MAGAZINE**

1240 ONTARIO STREET  
CLEVELAND 13, OHIO



**ALLIS-CHALMERS**  
(BUDA)

OFFERS YOU A CHOICE OF ENGINES  
DIESEL, GASOLINE OR L-P GAS  
ALL BUILT BY BUDA

**Send for**

**Free Buda Booklet**

Here's all the information you need in 36 fact-packed pages of lift truck illustrations and statistics. Write for free copy!



Whatever fuel you prefer — Gasoline, Diesel or L.P. Gas — Buda offers you an engine that is built heavier, built stronger, and built for longer, trouble-free service. Only Buda makes its own! This means the engine is specially designed, for the type of fuel to be used, by industrial engine experts for the Buda Fork Lift Truck — designed to do heavy jobs. Buda engines have 85% parts interchangeability, provide 30% longer life, have proven fuel savings of up to \$500 a year. So, regardless of fuel — Gasoline, Diesel or L.P. Gas — Buda is a better buy.

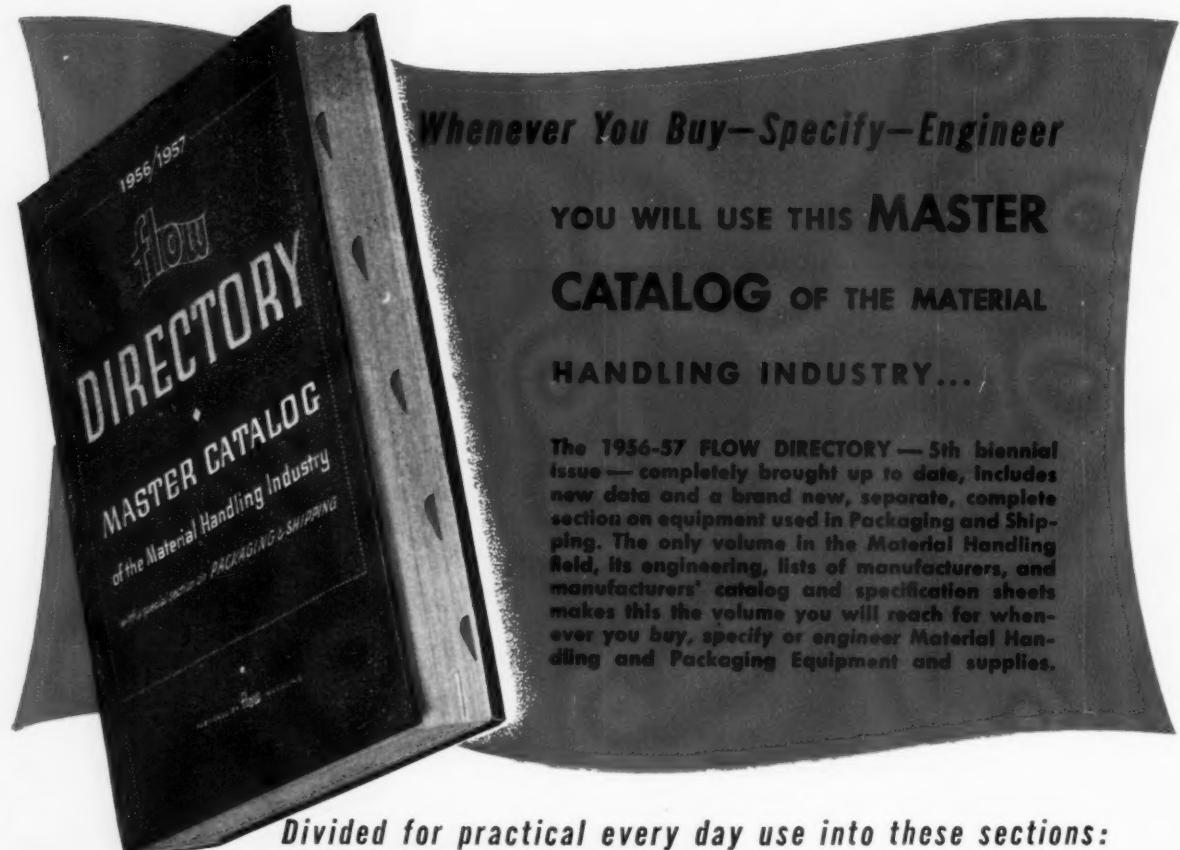
Buda Division, Harvey, Illinois



**ALLIS-CHALMERS**



Circle No. 24 on Reader Service Card for more information



*Divided for practical every day use into these sections:*

**EQUIPMENT & MANUFACTURERS.** A complete, illustrated, alphabetical manufacturers' listing, including descriptions and illustrations of all types of material handling machinery and equipment.

**TRADE NAME INDEX.** An alphabetical listing of trade names, the product of products they identify — tied to the names of the manufacturer.

**ENGINEERING & TECHNICAL DATA.** Tables, charts, graphs, and other pertinent technical data that have been collated for use by the engineers in the material handling field. This section is augmented by newly developed material.

**MANUFACTURERS' CATALOGS & OUTLETS.** Catalogs of equipment manufacturers in this field in alphabetical order, together with listing of their local outlets.

**THE INDUSTRIAL PACKAGING & SHIPPING MACHINERY SECTION ABSOLUTELY NEW, COMPLETELY DIFFERENT.** All material, technical guides, data and information pertinent to this field, along with manufacturers' catalog material, will be included in this section. This is a "first" — and has been developed at the insistent requests of thousands of users of the FLOW DIRECTORY.

**WHERE TO BUY OR RENT MATERIAL HANDLING EQUIPMENT.** A geographic listing of independent, local outlets throughout the United States and Canada. These "yellow pages" of the FLOW DIRECTORY have been brought completely up to date.

**flow DIRECTORY**

**MASTER CATALOG  
OF THE  
Material Handling  
Industry**

**FLOW DIRECTORY**

1240 ONTARIO STREET • CLEVELAND 13, OHIO

Send me ( ) copy(ies) of the 1956-57 FLOW DIRECTORY as soon as it is available.

Check enclosed ( ) Bill me ( )

Bill my company (Order No. )

Please make checks payable to FLOW DIRECTORY. Ohio sales - add 3%

Name .....

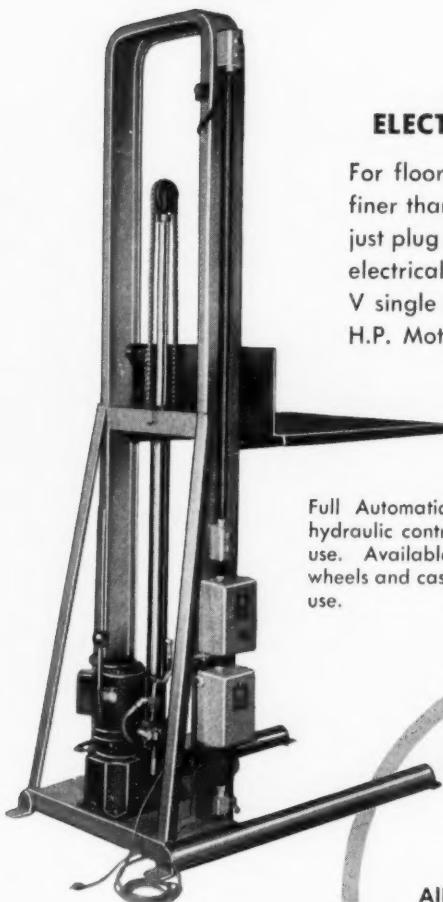
Company .....

City ..... State .....

**Ready  
January 1956**

**ORDER YOUR  
COPY TODAY**

**\$650**



**PRESTO DESIGNED**

### ELECTRIC STATIONARY LIFTS

For floor to floor delivery, there's nothing finer than PRESTO LIFTS. No installation — just plug into any receptacle or into the AC electrical supply line. Available in 110/220 V single phase or 220/440 V 3 phase,  $\frac{3}{4}$  H.P. Motor. Maximum Capacity 1000 lbs.

Full Automatic electrical and hydraulic controls, for elevator use. Available mounted on wheels and casters for portable use.



Basic model. 1000 lb. capacity. Control handle at base. Wheels and casters optional. Available in lifting heights from 12" to 120" and higher.

### PRESTO LIFTS

All PRESTO Lifts are equipped with the PRESTO-Built trouble-free PRESTO Power Pack. This unit is available to industry.

Priced competitively.

Delivery from stock.

**PRESTO BUILT**



PRESTO Combination Lift.  
Straddle Pallet and Drum Stack-  
er. Portable. Battery-Operated.  
Available in lifting heights up to  
120". Available with line volt-  
age motor on request.

**LEE**



*Engineering Company*

269 Armistice Boulevard  
Pawtucket, Rhode Island



**Q U A L I T Y** is our Most Important Product

Circle No. 94 on Reader Service Card for more information

DECEMBER, 1955

# NEWS VIEWS TRENDS

---

## \$100,000,000 GOODYEAR EXPANSION

**Goodyear Tire & Rubber Company** is in the midst of a two-year plant expansion and improvement program costing one hundred million dollars. The capital improvement program involves several new plants in this country and abroad, as well as expansion and modernization of other plants, and wholesale and retail facilities.

## G. E. INCREASES RADIO FACILITIES

Expansion of its communication equipment manufacturing, warehouse and office facilities has been announced by General Electric Company. The new space will be used to augment two-way radio manufacturing operations at the G-E Kent Street Communication Equipment plant in Utica, New York, and to consolidate various office and warehousing activities.

## GAIR RENAMES TWO DIVISIONS

**Two Los Angeles divisions** have been renamed by Robert Gair Company, Inc. The Angelus Paper Box Company Division is now the Los Angeles Carton Division, and the Angelus Corrugated Box Division has become the Los Angeles Corrugated Box Division.

## WAYNE MFG. CO. BUYS AUTOETTE

**Principals of Wayne Manufacturing Company**, Pomona, California, have purchased Autoette, pioneer manufacturer of electric carriers, according to Charles M. Weinberg, president of Wayne. Two entirely new products have been indicated during the next year by Autoette, with a record number of transports scheduled for production. Maynard N. Franklin, who has been named to manage the Autoette plant, said that there was an increasing demand by industry for silent, inexpensively operated vehicles.

## G. B. LEWIS STOCK CHANGE

**Change in ownership** of the G. B. Lewis Company, Watertown, Wisconsin has been announced. Company stock has been purchased by active management and the Menasha Wooden Ware Corporation, producer of corrugated cartons. The G. B. Lewis Company remains a separate corporation.

## 3 FIRMS AFFILIATE

**A three-company affiliation** of McLaurin-Jones Company, Ludlow Manufacturing & Sales Company, and The Angier Corporation has been effected. In announcing the exchange of stock between the companies, John M. MacLaurin, president of McLaurin-Jones Company, pointed out advantages of combining research, packaging engineering and product development facilities.

# Trail your loads with L-S Standrive



## **you see better, work safer, work faster**

Good materials handling practice requires that you trail loads for both safety and efficiency. Yet only L-S Master Trucks with "Standdrive" are designed *specifically* for trailing loads.

### **Make this simple test, prove for yourself the advantages of "Standdrive" design:**



From a sitting position, with both hands on your desk, try turning around to get a clear view of everything behind you. Difficult, isn't it?

Now do the same thing from a standing position. Notice how much easier it is?

That's how "Standdrive" improves visibility for trailing loads safely . . . keeps operators alert and in full command of the truck.

**Dependable L-S Master Trucks are ordered and reordered by "blue chip" companies. Recent reorders include:**

Rubber Co.	28 L-S in use — reordered 6
Electronics Mfg. Co.	297 L-S in use — reordered 35
Motor Car Co.	45 L-S in use — reordered 5
Glass Mfg. Co.	22 L-S in use — reordered 9

"Standdrive" also lets you work faster . . . no time wasted turning truck around. Just drive forks under the load . . . lift . . . and trail it away.

In addition to exclusive "Standdrive", Lewis-Shepard Electrics offer you such quality features as "lubricated for life" design . . . never need greasing; highly efficient L-S hydraulic system; quick, positive magnetic controls; gear drive . . . no chains or clutches to wear out.

Why not write for all the facts? Use the convenient coupon below.



### **LEWIS-SHEPARD®**

**1312 Walnut St., Watertown 72, Mass.**

*The Master™*

Please send

Catalog #32 showing L-S Trucks with "Standdrive"  
 Bulletin on Leasing, Renting, and Financing Facilities

Name \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

Circle No. 96 on Reader Service Card for more information



# CATALOGS

offered in

**Pulsating Panels . . .** Literature offered by Gerotor May Corporation tells how to assure constant material flow from bins and hoppers.

Circle 65 on Reader Service Card

**Fork Trucks . . .** Catalog 32 available from Lewis-Shepard Products, Inc. points out the advantages of Standrive fork truck operation.

Circle 96 on Reader Service Card

**Conveyor Belting . . .** Folder published by Buffalo Weaving & Belting Company tells how to buy the right conveyor belt for your particular job. The literature contains illustrated uses, maintenance tips, sizes and prices.

Circle 25 on Reader Service Card

**Freight Elevators . . .** Booklet B-705 available from Otis Elevator Company describes in detail heavy duty freight elevators.

Circle 117 on Reader Service Card

**Conveyors . . .** Full details on engineered automation—ideas, methods and experience—are offered by Service Conveyor Company.

Circle 128 on Reader Service Card

**Pallet Truck . . .** The Raymond Corporation offers details on its hand pallet truck with skid adapter.

Circle 122 on Reader Service Card

**Mobile Radio . . .** The versatility, construction and low maintenance features of G-E industrial radio are pointed out in literature published by General Electric Company.

Circle 64 on Reader Service Card

**Engines . . .** The best engineered, most economical answer to your power problem is a Chrysler engine, says literature from Chrysler Corporation, Industrial Engine Division.

Circle 32 on Reader Service Card

**Sweeper . . .** Details are offered by G. H. Tennant Co. on how one floor machine outperforms a crew of men.

Circle 139 on Reader Service Card

**Stitcher . . .** Information is available from Diagraph-Bradley Industries Inc. on the Young Conqueror wire stitcher with an electrically actuated post.

Circle 46 on Reader Service Card

**Carts . . .** Catalog from Sterling Wheelbarrow Company describes heavy duty carts with perfect balance.

Circle 134 on Reader Service Card

**Strapping . . .** A 36 page Blue Book of Packaging is offered free by Gerrard Steel Strapping Division of United States Steel Corp.

Circle 66 on Reader Service Card

**Containers . . .** Gaylord Container Corporation has information available on all types of corrugated containers.

Circle 62 on Reader Service Card

**Bag Closers . . .** Details on bag closing machines built to stand up under heavy production schedules are available from Union Special Machine Company.

Circle 148 on Reader Service Card

**Electric Trucks . . .** Bulletin 53 from The Moto-Truc Co. describes the complete line of the company that originated the walkie and small rider trucks.

Circle 110 on Reader Service Card

**Skid Boxes . . .** Illustrated literature published by The Union Metal Manufacturing Co. describes metal skid boxes engineered for more compact storing.

Circle 147 on Reader Service Card

**Dockboards . . .** Ten big advantages of Magliner dock boards are pointed out in literature offered by Magline, Inc.

Circle 100 on Reader Service Card

**Electric Fork Truck . . .** One Elpar fork truck gives you more muscle power than 10 men, according to data from The Elwell-Parker Electric Company that depicts a variety of attachments that add to the truck's versatility.

Circle 52 on Reader Service Card

# and BULLETINS

advertisements in this publication

**Tractor-Shovel . . .** Data offered by Tractomotive Corp. tells how the Tracto-Loader operates with ease inside a box car.

Circle 144 on Reader Service Card

**Storage Batteries . . .** Material on its Plus-Performance Plan is offered by Gould-National Batteries, Inc.

Circle 73 on Reader Service Card

**Containers . . .** Information is available from Ackermann Manufacturing Co. on the Band-Box container that ships, stacks, stores, bands, nests and palletizes.

Circle 1 on Reader Service Card

**Metal Belts . . .** Catalog 5 from Cyclone Fence Department, American Steel & Wire Division, contains 32 pages of facts on wire mesh processing belts.

Circle 13 on Reader Service Card

**Barrier Material . . .** If you want positive protection against breakage—switch to Kimpak Interior Packaging, says literature from Kimberly-Clark Corp.

Circle 90 on Reader Service Card

**Fork Trucks . . .** A choice of Diesel, gas, or LP-gas engines is yours when you purchase a Buda fork truck, according to literature from Allis-Chalmers Mfg. Co., Buda Division, which gives details.

Circle 24 on Reader Service Card

**Fasteners . . .** Data on how you can save money on fastening costs is available from Bostitch. Circle 21 on Reader Service Card

**Hoists . . .** Bulletin 410 from Manning, Maxwell & Moore, Inc. tells how its electric hoists can cut load-handling costs.

Circle 102 on Reader Service Card

**Casters . . .** Manual offered by Darnell Corp., Ltd. deals with casters and wheels designed for tough jobs.

Circle 40 on Reader Service Card

**Air Hoists . . .** Keller Tool Division of Gardner-Denver Company describes a safe and easy way to handle loads up to 150 lbs.

Circle 89 on Reader Service Card

**Side Loading Fork Truck . . .** Descriptive bulletin No. 1360 published by The Baker-Raulang Company tells how to solve the awkward problems of yard handling, particularly long loads.

Circle 16 on Reader Service Card

**Racks . . .** The Roberts Company offers a free copy of booklet "How You Can Cut Carpet Handling Costs".

Circle 50 on Reader Service Card

**Walkie Trucks . . .** The complete line of PowerOx walkie trucks is described in literature offered by Barrett-Cravens Co.

Circle 28 on Reader Service Card

**Feeders . . .** Simplicity Engineering Company offers literature on Os-A-Veyor feeders designed to handle heavy column loads.

Circle 131 on Reader Service Card

**Fiber Containers . . .** Catalog 54 published by the Fibre Specialty Division of National Vulcanized Fibre Company tells how to reduce costs and increase plant efficiency.

Circle 59 on Reader Service Card

**Tractor-Shovel . . .** Information on how you can mechanize your bulk handling operations for a very small sum is offered by The Baker-Raulang Company.

Circle 17 on Reader Service Card

**High Lift Rider . . .** John Morrell Mfg. Co. offers data on the MorLift truck, said to be high in performance, low in price.

Circle 109 on Reader Service Card

**Ramp-Dockboards . . .** If you have a difficult dock problem, Magnesium Company of America has published a bulletin on the subject which might be of help.

Circle 101 on Reader Service Card

**Fork Trucks . . .** Hyster Company has information on how to select the right industrial truck and attachment.

Circle 80 on Reader Service Card

Use This

## READER SERVICE CARD

to obtain information on any item in this issue

### New Equipment & Supplies

Starting on Page 141

### Useful Literature

Starting on Page 126

### PLEASE PRINT

DECEMBER, 1955. Do not use after 3-15-56

Name ..... Position .....

Company ..... Kind of Business .....

Street .....

City ..... Zone..... State.....

PLEASE SEND ME ADDITIONAL INFORMATION AND LITERATURE ON ITEMS CIRCLED BELOW.

1	18	35	52	69	86	103	120	137	154	171	188	205	222	239	256	273	290	307	324
2	19	34	53	70	87	104	121	138	155	172	189	206	223	240	257	274	291	308	325
3	20	37	54	71	88	105	122	139	156	173	190	207	224	241	258	275	292	309	326
4	21	38	55	72	89	106	123	140	157	174	191	208	225	242	259	276	293	310	327
5	22	39	56	73	90	107	124	141	158	175	192	209	226	243	260	277	294	311	328
6	23	40	57	74	91	108	125	142	159	176	193	210	227	244	261	278	295	312	329
7	24	41	58	75	92	109	126	143	160	177	194	211	228	245	262	279	296	313	330
8	25	42	59	76	93	110	127	144	161	178	195	212	229	246	263	280	297	314	331
9	26	43	60	77	94	111	128	145	162	179	196	213	230	247	264	281	298	315	332
10	27	44	61	78	95	112	129	146	163	180	197	214	231	248	265	282	299	316	333
11	28	45	62	79	96	113	130	147	164	181	198	215	232	249	266	283	300	317	334
12	29	46	63	80	97	114	131	148	165	182	199	216	233	250	267	284	301	318	335
13	30	47	64	81	98	115	132	149	166	183	200	217	234	251	268	285	302	319	336
14	31	48	65	82	99	116	133	150	167	184	201	218	235	252	269	286	303	320	337
15	32	49	66	83	100	117	134	151	168	185	202	219	236	253	270	287	304	321	338
16	33	50	67	84	101	118	135	152	169	186	203	220	237	254	271	288	305	322	339
17	34	51	68	85	102	119	136	153	170	187	204	221	238	255	272	289	306	323	340

BUSINESS REPLY CARD  
NO POSTAGE STAMP NECESSARY IF MAILED IN THE UNITED STATES

3¢ POSTAGE WILL BE PAID BY: Reader Service Department

FIRST CLASS  
PERMIT No. 8066  
SEC. 34.9 P. L. & R.  
CLEVELAND, OHIO

FLOW

1240 ONTARIO STREET • CLEVELAND 13, OHIO

## CATALOGS AND BULLETINS

*Continued*

Use This

### READER SERVICE CARD

to obtain information on any item in this issue

New Equipment & Supplies ..... Starting on Page 141  
Useful Literature ..... Starting on Page 126

**BUSINESS REPLY CARD**  
NO POSTAGE STAMP NECESSARY IF MAILED IN THE UNITED STATES

3¢ POSTAGE WILL BE PAID BY: Reader Service Department

## FLOW

1240 ONTARIO STREET • CLEVELAND 13, OHIO

PLEASE PRINT

DECEMBER, 1955. Do not use after 3-15-56

Name ..... Position .....

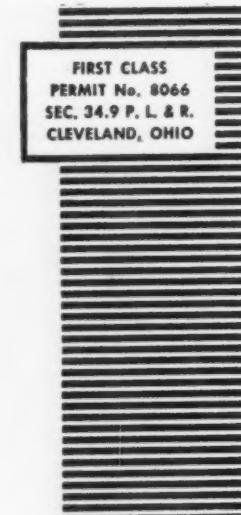
Company ..... Kind of Business .....

Street .....

City ..... Zone ..... State .....

PLEASE SEND ME ADDITIONAL INFORMATION AND LITERATURE ON ITEMS CIRCLED BELOW.

1	18	35	52	69	86	103	120	137	154	171	188	205	222	239	256	273	290	307	324
2	19	36	53	70	87	104	121	138	155	172	189	206	223	240	257	274	291	308	325
3	20	37	54	71	88	105	122	139	156	173	190	207	224	241	258	275	292	309	326
4	21	38	55	72	89	106	123	140	157	174	191	208	225	242	259	276	293	310	327
5	22	39	56	73	90	107	124	141	158	175	192	209	226	243	260	277	294	311	328
6	23	40	57	74	91	108	125	142	159	176	193	210	227	244	261	278	295	312	329
7	24	41	58	75	92	109	126	143	160	177	194	211	228	245	262	279	296	313	330
8	25	42	59	76	93	110	127	144	161	178	195	212	229	246	263	280	297	314	331
9	26	43	60	77	94	111	128	145	162	179	196	213	230	247	264	281	298	315	332
10	27	44	61	78	95	112	129	146	163	180	197	214	231	248	265	282	299	316	333
11	28	45	62	79	96	113	130	147	164	181	198	215	232	249	266	283	300	317	334
12	29	46	63	80	97	114	131	148	165	182	199	216	233	250	267	284	301	318	335
13	30	47	64	81	98	115	132	149	166	183	200	217	234	251	268	285	302	319	336
14	31	48	65	82	99	116	133	150	167	184	201	218	235	252	269	286	303	320	337
15	32	49	66	83	100	117	134	151	168	185	202	219	236	253	270	287	304	321	338
16	33	50	67	84	101	118	135	152	169	186	203	220	237	254	271	288	305	322	339
17	34	51	68	85	102	119	136	153	170	187	204	221	238	255	272	289	306	323	340



## CATALOGS AND BULLETINS

**Casters . . .** You can make old equipment roll like new with Load Floating casters, says literature from The Colson Corporation.  
Circle 36 on Reader Service Card

**LP-Gas Trucks . . .** Complete details on LP-Gas operated fork trucks are available from Lamson Mobilift Corporation.  
Circle 92 on Reader Service Card

**Conveyors . . .** Details on what is claimed to be the most versatile conveyor in Industry offered by Union Steel Products Co.  
Circle 150 on Reader Service Card

**Ramps . . .** Trans-O-Matic ramps are described in a free booklet from Globe Hoist Company titled "Case Studies in Modern Lifting".  
Circle 68 on Reader Service Card

**Paper . . .** Sample grades of Wrap-Dri paper and suggestions concerning your packaging problems will be sent free by Thilmany Pulp & Paper Company.  
Circle 142 on Reader Service Card

**Containers . . .** Illustrated booklet from General Box Co., contains suggestions on how to reduce packaging, shipping costs.  
Circle 63 on Reader Service Card

**Belting . . .** Thermoid Company will send details on how its conveyor belting cuts handling costs in quarries.  
Circle 140 on Reader Service Card

**Tapes . . .** Folder on Scotch filament tapes may be obtained from Minnesota Mining & Mfg. Co.  
Circle 108 on Reader Service Card

**Dockboards . . .** Literature from Washington Aluminum Co., Inc. gives details on aluminum dockboards and ramps.  
Circle 158 on Reader Service Card

**Doors . . .** How Rubbair doors speed handling, reduce repairs and protect loads is told in literature available from Stic-Klip Manufacturing Co., Inc., Rubbair Door Division.  
Circle 135 on Reader Service Card

**Process Belts . . .** Woven wire and flat wire designs of process belts are described in catalog F55 by Ashworth Bros., Inc.  
Circle 11 on Reader Service Card

**Tow Trucks . . .** New 24 page catalog published by The Lansing Company covers tow trucks for underfloor or overhead conveyors, in addition to other warehouse trucks.  
Circle 93 on Reader Service Card

**Slings . . .** Capacities up to 100,000 pounds can be handled with its Gripper woven wire slings, says data from The Cambridge Wire Cloth Co.  
Circle 29 on Reader Service Card

**Tail Gates . . .** Information on hydraulic Lift Gates that let one man do the work of three is available from Anthony Company.  
Circle 10 on Reader Service Card

**Tractors . . .** The answer to fast, dependable, economical hauling over long distances is the Trackless Train system, claims Mercury Manufacturing Company, which offers details.  
Circle 166 on Reader Service Card

**Forks . . .** Swing-Shift Mfg. Co. offers details on forks that swing and shift 14% more daily.  
Circle 133 on Reader Service Card

**Circle 136 on Reader Service Card**

**Casters . . .** Fast, easy handling can be accomplished with casters built for the job, says literature from Bond Foundry & Machine Co.  
Circle 20 on Reader Service Card

**Trailers . . .** Information on heavy duty trucks and trailers from The Ohio Galvanizing & Mfg. Co.  
Circle 115 on Reader Service Card

**Strapping . . .** A complete survey of your packaging and shipping methods is offered by Signode Steel Strapping Co.  
Circle 129 on Reader Service Card

**Racks . . .** Catalog from The Paltier Corp. tells how to earn money with a Paltier system.  
Circle 120 on Reader Service Card

**Work Positioner . . .** How Lowerators help solve work-positioning problems is told in folder L-131 by American Machine & Foundry Co., Lowerator Div.  
Circle 6 on Reader Service Card

**Pallet Loaders . . .** Details on automatic pallet loaders are offered by Lamson Corporation.  
Circle 165 on Reader Service Card

**Strapping . . .** Catalog SS-9C from Stanley Steel Strapping Division deals with strapping machines and tape.  
Circle 133 on Reader Service Card

**Hoppers . . .** Roura Iron Works, Inc. will send information on self-dumping hoppers designed to cut the cost of hand unloading by at least 50 percent.

Circle 126 on Reader Service Card

**Troughing Idlers . . .** Bulletin 25-42 from Joy Manufacturing Company gives details on the Limberoller conveyor idler.

Circle 88 on Reader Service Card

**Labeling . . .** Brochure is available from Sten-C-Labl, Inc. on how Sten-C-Labs save time and costly shipping errors.

Circle 164 on Reader Service Card

**Storage Batteries . . .** The inside story on new Exide-Iron clads with Polyethylene is available from The Electric Storage Battery Co., Exide Industrial Div.

Circle 57 on Reader Service Card

**Tubular Conveyors . . .** Catalog from Hapman Conveyors, Inc. tells how you can cut costs and solve handling problems with tubular conveyors for wet or dry bulk flowable materials.

Circle 74 on Reader Service Card

**Storage Bins . . .** The Neff & Fry Co. tells about its bins in a folder titled "Bins With the Strength of Pillars".

Circle 111 on Reader Service Card

**Skids . . .** You can provide easy mobility to a variety of industrial products with its all-purpose handling units, claims data of Ironbound Box & Lumber Co.

Circle 83 on Reader Service Card

**Tow Trucks . . .** Jakes Foundry Company offers full information on Safe-Tow conveyor trucks to speed order picking and storage.

Circle 75 on Reader Service Card

# the morLift



*Saves space...time...  
man hours...money*

**Easy to Operate.** Adding to such features as low overall weight and a full 180° turning radius, the morLift offers an exclusive direction indicator, automobile-type brakes and lever type handles for travel and lift.

**Easy to Maintain.** Time and money saving as well as easy! Built-in battery charger plugs into any convenient outlet. Automatic controls prevent overcharging, and catalyst hydro-caps help maintain a safe water level. Excellent accessibility to all parts.

**Less in Cost.** Tho your morLift comes complete with battery and built-in charger, it costs much less than comparable hydraulic lift trucks. Specifically designed for 1000 and 2000 pound load capacities, the morLift keeps initial costs way down.



*For the smartest move  
you'll ever make  
ride a morLift*

**JOHN MORRELL MFG. CO.  
222 DUNDEE AVE., ELGIN, ILLINOIS**

*Write Dept. 141 or check your phone book for nearest distributor  
Circle No. 109 on Reader Service Card for more information*

Have a storage  
problem?  
Check on space saving  
**Union Metal**  
**skid boxes**



WITH Union Metal steel skid boxes, available storage space goes a lot further. Boxes are engineered for closer, more compact storing . . . quick, easy, and most important, safe tiering from floor level to ceiling. Double corrugated skids take heavy loading longer, give extra protection against fork truck abuse. Learn how you too can increase available storage area by 33½% with Union Metal skid boxes.

Write today for illustrated literature on industry's broadest line of Material Handling Equipment. Address The Union Metal Manufacturing Company, Canton 5, Ohio.

From the smallest shop boxes to huge production positioning hoppers.

**UNION METAL**  
*Material Handling Equipment*

Circle No. 147 on Reader Service Card for more information

**AD LITERATURE**

*Continued*

**Engines . . .** Wisconsin Motor Corp. says its engines are ideally adapted to a great variety of material handling equipment.

Circle 159 on Reader Service Card

**Weight Indicators . . .** If your crane operator lifts heavy loads by sheer guesswork he might as well be blindfolded, claims Martin-Decker Corp. The manufacturer suggests use of a crane weight indicator that warns operator of excessive loads before they are lifted.

Circle 103 on Reader Service Card

**Roller Chains . . .** Catalog 754 from Diamond Chain Company, Inc. contains 64 pages of useful information on roller chains.

Circle 47 on Reader Service Card

**Framing . . .** An idea brochure about what you can build with slotted framing material may be obtained from the Dexion Division of Acme Steel Company.

Circle 2 on Reader Service Card

**Cranes . . .** Catalog from The Euclid Crane & Hoist Company tells how to modernize your crane instead of replacing it.

Circle 55 on Reader Service Card

**Cranes . . .** A modest crane investment can return important profits, says data from Conco Engineering Works.

Circle 37 on Reader Service Card

**Dock Covers . . .** Literature from Capco tells how you can completely enclose the space between car and building doorways, protecting loading and unloading during bad weather.

Circle 30 on Reader Service Card

# Half-Yard Loader Scoots Around in Boxcar

**Compact Tractomotive TL-6 Tracto-Loader  
is High Producer in Confined Areas**



## **Feeds Conveyor From Inside Boxcar**

TL-6 Tracto-Loader moves bulk material from a boxcar to a conveyor set up just outside car door. This 33.7 hp loader has a full half-yard bucket, yet it can scoot around in this confined area, make right-angle turns without jockeying.

Here is a real production booster where work space is limited. The TL-6 is ideal for unloading boxcars, traveling through narrow aisles and doorways, making hairpin turns near columns and posts. Has short, 6½-ft turning radius . . . over-all length only 9 ft, 7 in., width 4 ft, 5 in.

You get big loads fast and you carry them low. Torque converter drive eliminates engine stalling . . . crowding is positive and smooth. Bucket has scooping action — tips back 22° at floor level. Reaches carry position, 50° tip-back, at only 3 ft above floor — means easier maneuvering, greater stability, better visibility.

As for ease of handling, operators say it's the best yet. Forward and reverse are controlled by a single, smooth-working lever — no gear shifting necessary. Reverse is twice as fast as forward — lets you get away from the pile "on the double."

Ask your Allis-Chalmers Industrial Tractor Dealer to show you the TL-6 or the two larger Tracto-Loaders in action.



## **For bigger, tougher jobs, see the Tractomotive TL-10 Tracto-Loader**

— the industrial wheel loader that proved the soundness of Tracto-Loader design. It set new standards in loader performance with a combination of hydraulic torque converter drive and clutch-type transmission. Has 63-brake hp, 1-cu-yd tip-back bucket. Various interchangeable attachments.

**Sold and Serviced by your Allis-Chalmers Industrial Tractor Dealer**

# **TRACTOMOTIVE**

**TRACTOMOTIVE CORPORATION • Deerfield, Illinois**

Circle No. 144 on Reader Service Card for more information

Tracto-Loaders • Tracto-Shovels • Side Booms and Hydraulic Rippers for Allis-Chalmers Crawler Tractors • Loader and Shoulder Maintainer for Allis-Chalmers "D" Motor Grader

# FACTS ABOUT **Exide**<sup>®</sup>

## IRONCLAD<sup>®</sup> INDUSTRIAL TRUCK BATTERIES

WORLD'S LARGEST UNDERGROUND "REFRIGERATOR"

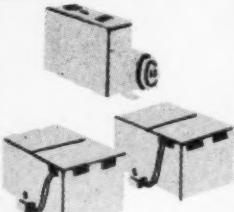
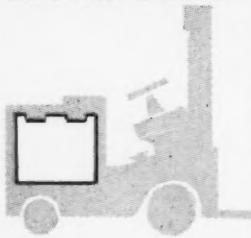
**STORES MORE FOOD FASTER...  
SAFER WITH EXIDES!**

IN AREAS REFRIGERATED TO SUB-ZERO TEMPERATURES A RAPID AND UNIFORM RATE OF MOVING FOODSTUFFS FROM LOADING PLATFORMS TO STORAGE CHAMBERS IS ASSURED BY EXIDE-POWERED ELECTRIC TRUCKS AT NATURAL STORAGE COMPANY IN BONNER SPRINGS, KANSAS. EXIDE-IRONCLADS WORK DEPENDABLY UNDER SEVERE OPERATING CONDITIONS—PROVIDE POWER WITHOUT CONTAMINATING FUMES OR NOISE. EXIDE-IRONCLADS PROVIDE THE SAFEST, FASTEST, LOWEST COST METHOD OF MOVING—STACKING—STORING MATERIALS. EXIDES ARE ALWAYS—

**YOUR BEST MOTIVE POWER BUY—AT ANY PRICE!**



**NOW! CASH OUTLAY FOR  
ELECTRIC TRUCKS CUT DRastically  
BY NEW EXIDE PLAN!**



**BUY** ONLY THE TRUCK CHASSIS! CUT INITIAL CAPITAL OUTLAY AS MUCH AS 33 1/3%!

**LEASE** EXIDE-IRONCLAD BATTERIES AND CHARGER!

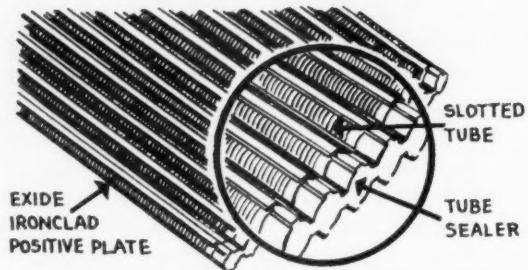
IN ADDITION TO THE SUPERIOR OPERATION OF ELECTRIC TRUCKS YOU GET BIG ANNUAL SAVINGS. A TYPICAL EXAMPLE OF HOW MUCH YOU SAVE EACH YEAR WITH ELECTRIC TRUCKS AND THE EXIDE PLAN:

1 TRUCK ON 3-SHIFT OPERATION SAVES \$1425.76!

MAKE US PROVE THESE SAVINGS! CALL YOUR EXIDE SALES ENGINEER. ASK YOUR ELECTRIC TRUCK SALESMAN. WRITE FOR COMPLETE DETAILS ON THE EXIDE LEASING PLAN!

LET EXIDE HELP SOLVE YOUR INDUSTRIAL TRUCK BATTERY PROBLEMS. ① CALL AN EXIDE SALES ENGINEER FOR FULL DETAILS. ② WRITE FOR FORM 1982, A MANUAL ON INSTALLING AND MAINTAINING MOTIVE POWER BATTERIES.

**MAGIC POWER TUBES  
OF POLYETHYLENE!**



NOW, ACID-PROOF, NON-CORRODING POLYETHYLENE PLASTIC TUBES AND SEALERS ARE INSIDE ALL EXIDE-IRONCLADS! DEVELOPED IN THE LABORATORY, TESTED IN THE FIELD, AND ALREADY PROVED IN CUSTOMER USE—THIS MIRACLE BATTERY MATERIAL IS THE LATEST IMPROVEMENT IN EXIDE-IRONCLADS. ITS USE GIVES YOU MORE POWER IN THE SAME SPACE! LONGER BATTERY LIFE! BETTER PERFORMANCE! LESS MAINTENANCE!

FOR THE AMAZING "INSIDE STORY" ON NEW EXIDE-IRONCLADS WITH POLYETHYLENE, CALL YOUR EXIDE SALES ENGINEER!

**Exide INDUSTRIAL DIVISION**, The Electric Storage Battery Company, Philadelphia 2, Pa.

Circle No. 57 on Reader Service Card for more information

*New*  
**PAYLOADER®**

Model HAH

Bucket Capacity — 1 cu. yd.  
 Lifting Capacity — 4,000 lbs.  
 Carry Capacity — 3,000 lbs.  
 Breakout Force — 4,500 lbs.  
 Torque Converter Drive  
 Power Steer



**Which best fits your needs?**

*New*  
**PAYLOADER®**

Model HA

Bucket Capacity — 18 cu. ft.  
 Lifting Capacity — 3,000 lbs.  
 Carry Capacity — 2,000 lbs.  
 Breakout Force — 3,000 lbs.  
 Torque Converter Drive



Now, Hough, the pioneer and leader in the tractor-shovel industry, gives you a choice of two new, more productive "PAYLOADER" units. Both have front-wheel-drive and rear-wheel-steer — especially designed for stockpile work and fast material moving in close quarters. They're the finest of their type in Hough

history — they're both way ahead of the field in design, performance and all-round value.

FEATURES of these outstanding new models include: 40° bucket tip-back at ground; torque converter drive; full-reversing transmissions; closed, pressure-controlled hydraulic system; large hydraulic brakes; accumulator in hydraulic system that prevents pressure shocks and facilitates bucket control; power steer on model HAH. Your nearby "PAYLOADER" Distributor is eager to show what these new machines can do for you.

Use the coupon below to get full information on any "PAYLOADER" model.



**PAYLOADER®**  
MANUFACTURED BY  
 THE FRANK G. HOUGH CO., LIBERTYVILLE, ILL.  
SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY



THE FRANK G. HOUGH CO. • 731 SUNNYSIDE AVENUE • LIBERTYVILLE, ILLINOIS  
 Send data on "PAYLOADER" units

Model HA  Model HAH  larger sizes

Name .....

Title .....

Firm .....

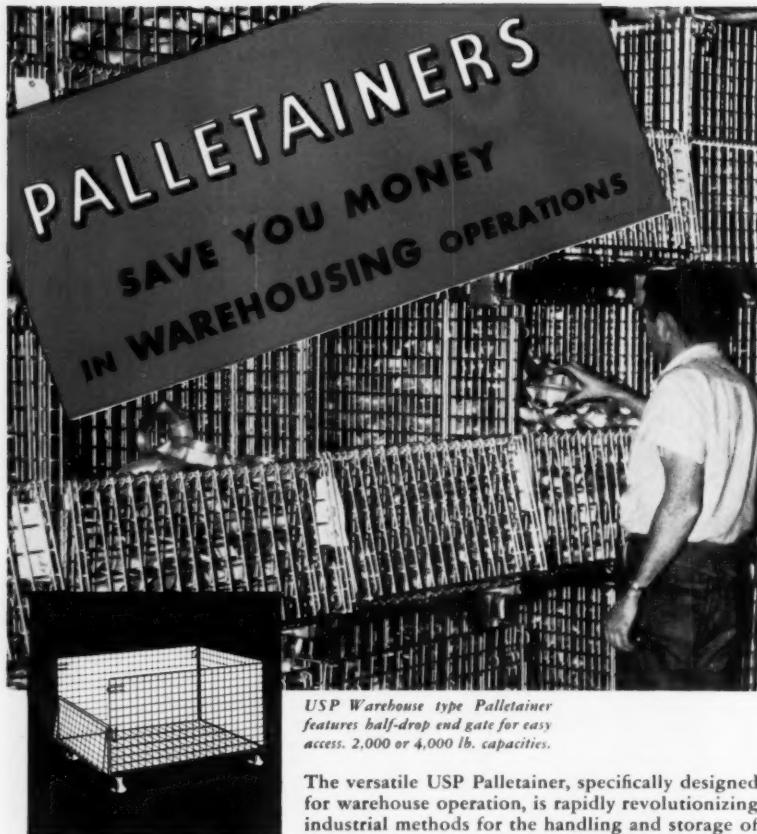
Street .....

City .....

State .....

Circle No. 78 on Reader Service Card for more information

DECEMBER, 1955

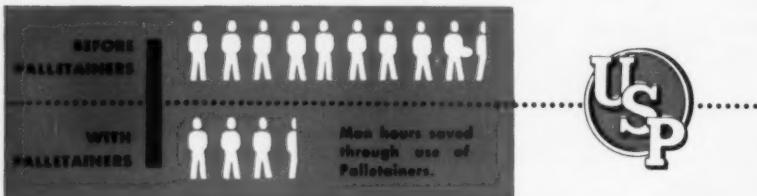


**USP Palletainers**  
are available in a wide range of sizes, types, styles and loading capacities from 500, 1250, 2000, 4000 and 6000 pounds per unit. There's a Palletainer to meet every need.

*USP Warehouse type Palletainer features half-drop end gate for easy access. 2,000 or 4,000 lb. capacities.*

The versatile USP Palletainer, specifically designed for warehouse operation, is rapidly revolutionizing industrial methods for the handling and storage of service parts. Its special features make it readily adaptable to many other uses throughout the plant. The special hinged-end access door allows fast, easy removal or replacement of contents. This feature, plus the exclusive USP steel stacking leg permits stacking in positions that afford greater space savings, require less aisle space and permit free access to men and lift trucks. Add to these features the advantages of visual inventory, increased storage capacity and fold-flat shipping and storage and you can see where USP Warehouse Palletainers save time, labor and money.

Get all the facts on Palletainers today—write for full information, specifications and costs. USP materials handling engineers are at your service—without obligation.



### UNION STEEL PRODUCTS CO. ALBION, MICHIGAN

Please send me complete information on Palletainer application.

Name and Title \_\_\_\_\_

Firm and Name \_\_\_\_\_

Address \_\_\_\_\_

City, Zone and State \_\_\_\_\_

Circle No. 149 on Reader Service Card for more information

## Calendar of Events

### December 11-13

Material Handling Institute,  
Statler Hotel,  
New York, New York

### December 12-16

International Atomic Exposition,  
Public Auditorium,  
Cleveland, Ohio

### December 14-15

Industrial Truck Association,  
Statler Hotel,  
New York, New York

### January 18-19, 1956

Caster and Fork Truck  
Manufacturers Association  
New Weston Hotel, N. Y., N. Y.

### January 23-26, 1956

Plant Maintenance &  
Engineering Show,  
Convention Hall,  
Philadelphia, Pennsylvania

### April 9-12, 1956

National Packaging Exposition,  
Convention Hall,  
Atlantic City, New Jersey

### June 5-8, 1956

The Material Handling Institute's  
Exposition of 1956,  
Public Auditorium,  
Cleveland, Ohio

*buy and use*



**CHRISTMAS  
SEALS**  
*fight tuberculosis*



# NO FLATS with **NOTATS**

An unretouched photograph showing Laminated NOTAT TIRES performing under adverse conditions.

Notat laminated tires completely eliminate "down-time" caused by tire trouble. There's no tube or air chamber to go flat. And, unlike solid tires, Notats will "give" to prevent the jarring of loads . . . will actually ride and steer like pneumatics at in-plant speeds. Notat's laminated construction features hundreds of "pads" molded together (reinforced with steel bands)—yet each pad functions individually for greater traction and faster stopping.

For elimination of down-time, easier steering, greater traction and longer life, switch to NOTATS. In sizes from 4.00 x 8 to 8.50 x 24. Write today for price list and further information.

#### SOLD BY MATERIALS HANDLING EQUIPMENT DEALERS EVERYWHERE

##### NOTAT TIRES AVAILABLE AS OPTIONAL ORIGINAL EQUIPMENT BY THE FOLLOWING MANUFACTURERS—

Allis-Chalmers	Buda Fork Lift Trucks
Barrentine	Pasture Clippers
Butler	Car Scoops
Clark	Lift Trucks
Clark	Michigan Tractor Shovels 12B
Clark	Towing Tractors
Getman	Scoot-Cretes
Hough	HA Payloaders
Jaeger	Front End Loaders
Lawrence Bros.	Bush-Hog Rotary Cutters
Taylor	Pasture Dream Clippers
Tractomatic	Tracto Loaders TL6
Trojan	Loaders
Wood's	Rotary Cutters
Worthington	Rotary Blizzers
Yonkers & Johnson	Two-Way Plows



The original laminated tire — accept no substitutes

NOTAT TIRE CO.  
1504 E. 34th ST.  
CHATTANOOGA, TENN.

Gentlemen:

Please send me a copy of your Notat price list and further information on how NOTATS will reduce tire cost and eliminate down-time.

NAME \_\_\_\_\_

CO. NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_

ZONE STATE \_\_\_\_\_



**NOTAT  
TIRE COMPANY**

• CHATTANOOGA, TENN.

Circle No. 114 on Reader Service Card for more information

# "Best Operating Insurance Money Can Buy"



When you buy a Gould Research-Built Battery, you not only get the finest battery modern science can give you . . . you get also the finest, nation-wide field engineering service in the industry.

Strategically located in all principal cities, Gould Field Engineers are as near to you as your telephone . . . ready to help you get greatest possible service from your batteries and keep your facilities in operation. Through educational work with your maintenance staff, advice on selection and anticipation of battery needs and actual emergency servicing of batteries, your Gould Field Engineer is perfect operating insurance.

Call him in. You'll find it the best move you ever made. Don't forget to ask him for the new Gould Plus-Performance Plan material for your maintenance staff.

**"BETTER BATTERIES THROUGH RESEARCH"**

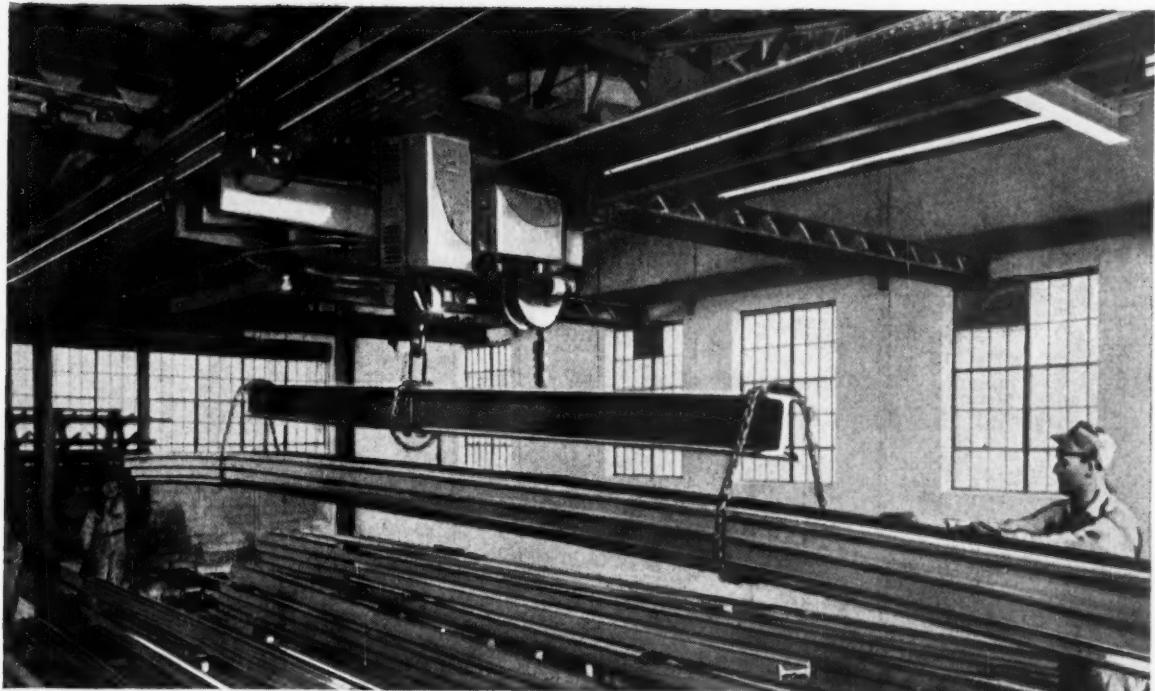
Always Use Gould-National Automobile and Truck Batteries

**GOULD**  
**Batteries**

GOULD-NATIONAL BATTERIES, INC.  
TRENTON 7, N. J.

©1955 Gould-National Batteries, Inc.

Circle No. 73 on Reader Service Card for more information



## Potentially, it's the best

**And Louden has the equipment, the experience and the engineering to turn its advantages to greatest account**

For many types of materials in many kinds of plants, overhead handling does indeed offer inherent advantages over other methods of handling. And Louden engineering, experience and range of equipment turn these advantages to greatest account. The Union Iron & Steel Company, Inc., shows how. Largest independent in Cincinnati, Union warehouses steel bars, plates and sheets to be cut and shipped to order. Union had overhead handling before, a crane that unloaded stock from freight cars and transferred its load roundabout to one of 4 parallel monorail tracks. But this resulted in slow handling and "dead" spots in storage.

Louden proposed an unusual installation with crane operating in the di-

agonal position to conform to the angle of the railroad siding at the rear of the building. This direct, flexible, straight-line handling would give inch by inch coverage of the storage area. Louden equipment was installed and it reduced unloading time from 4 hours for a 50-ton car to 50 minutes—a ton a minute. With every foot of space utilizable, Union gained 25% in storage capacity. Handling of stock to cutting machines was greatly expedited as well.

The difference lies in engineering concept. Louden's long experience gives a resourcefulness and flexibility of approach, an ability to deliver better handling to you. Your plans should include a consultation with Louden experts.

**THE LOUDEN MACHINERY COMPANY  
5312 Broadway, Fairfield, Iowa**  
*A Subsidiary of Mechanical Handling Systems, Inc.*

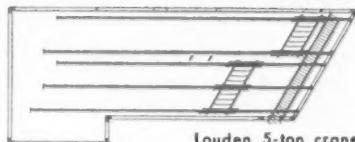
# Louden

**MONORAIL & CRANES**

SINCE 1867...THE FIRST NAME IN MATERIALS HANDLING

Circle No. 97 on Reader Service Card for further information

DECEMBER, 1955



Louden 5-ton crane operates in diagonal conforming to the angle of rear of building. Unlimited lengthwise and crosswise travel.

Crane and magnet lift 5-ton plate for shape-cutting.

Louden crane transfers 5 tons of angle iron to cutting machine.

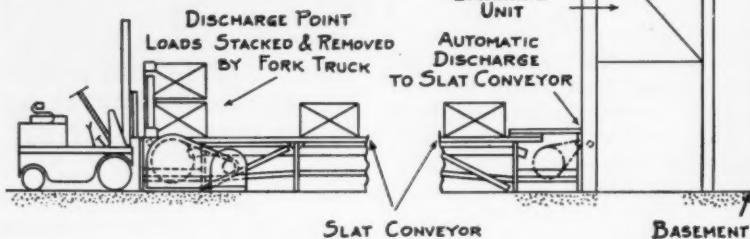
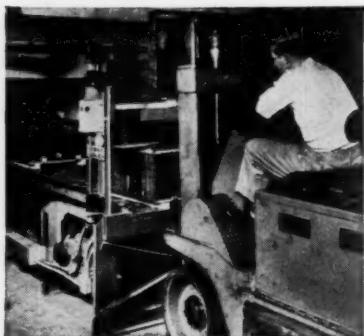


New! Louden Shokpruf Electrification for all monorail and crane installations. Hazards of open conductor bars now completely overcome by this exclusive Louden engineering development. Write for full details of this safe conductor system.

only through *Engineering*  
can *Efficiency* be achieved...  
**up  $87\frac{1}{2}\%$**

for department of a

**LARGE EASTERN CAN COMPANY\***



\*Company name available on request.

Like many foresighted manufacturing companies of today, this large eastern can manufacturing company, is constantly aware of in-plant materials handling as a major operating cost. The diagram and pictures present Gifford-Wood's solution to their problem of handling materials to storage. Long, empty return runs of the fork trucks used was only one aspect of the previous method of operation which was unduly expensive. Through the new G-W System, 2500-lb. bundles of steel sheets which formerly required eight hours to unload and store are now handled in one!

Working with Wigton-Abbott Corporation, Con-

sulting Engineers, Gifford-Wood applied the materials handling knowledge for the solution of a costly problem—and this is only typical of many such engineered installations. All elements of such an installation (length of horizontal conveyor travel, raising or lowering to floors above or below, etc.) are, of course, designed to best suit the particular conditions encountered.

The G-W Materials Handling Engineer in your area will be glad to discuss the most economical means of materials flow in your plant. Call on him—it may well be the first step toward higher profits through lower operating and maintenance costs.



**GIFFORD-WOOD CO.**

Since 1814 • Hudson, New York

NEW YORK 17, N. Y.      ST. LOUIS 1, MO.      CHICAGO 6, ILL.  
420 Lexington Ave.      RAILWAY EXCHANGE BLDG.      565 W. Washington St.

When you think of materials handling—Think of Gifford-Wood

© 1957

FLOW

Circle No. 67 on Reader Service Card for more information

# Install Chrysler Industrial Engines

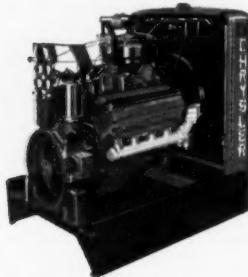
*...best-engineered, most-economical answer to your power problem*

Chrysler Power is the dependable, economical, lightweight answer to your high-speed or high-torque power requirements. Within their power ranges, each Chrysler Industrial Engine is a leader in the field and is recognized as such by manufacturers of almost every type of self-powered equipment.

Check the specifications. Note the optional equipment which can be factory supplied or installed to meet the

particular requirements of your equipment in the field. Whether equipped for Gasoline, Distillate Fuel, Propane or Natural Gas operation, Chrysler Industrial Engines offer definite advantages . . . performance, ease of maintenance, fast parts service, low initial and operating costs.

See the dealer nearest you, or write for complete information. **Dept. 2112, Industrial Engine Division, Chrysler Corporation, Trenton, Michigan.**



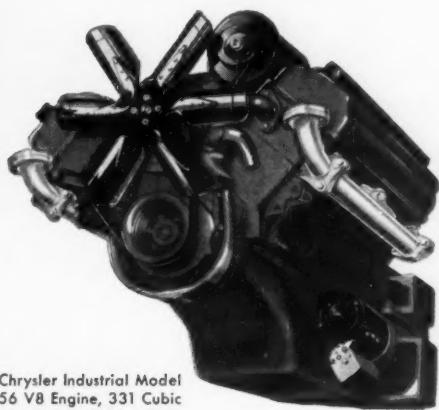
Chrysler Open Power Units. The open power units for all engines include the complete engine, skid base, radiator, instruments and instrument panel, flywheel and flywheel housing. Open power units for V-8 Models Ind. 52 and 56 (pictured), include twenty-five gallon fuel tank.



Chrysler Enclosed Power Units. The enclosed power units have the complete engine, fuel tank (Models Ind. 30, 31, 32 and 33—sixteen gallon, Models Ind. 52 and 56—twenty-five gallon), storage battery, instruments and instrument panel, flywheel, flywheel housing, skid base and completely enclosing sheet metal.

#### Optional Equipment—Chrysler Engines

Chrysler Industrial Torque Converter  
Chrysler gyrol Fluid Coupling  
Three, Four or Five-Speed Transmission  
Twelve or Twenty-four Volt Electrical System  
Distillate, Propane or Natural Gas Burning Carburetor  
Over-Center Clutch and Power Take-Offs  
Vertical or Horizontal Magneto  
Flexible Coupling for Truck-Type Flywheel  
Radio Shielding and Ignitors  
Heavy-Duty Oil Bath Air Cleaners  
Safety Switches (Low Oil Pressure, High Water Temperature)  
Corrosion or Fungus Resistant Electrical System



Chrysler Industrial Model 56 V8 Engine, 331 Cubic Inches Displacement (Front End Chain Drive)



Chrysler Industrial Model 33 Engine, 265 Cubic Inches Displacement (Front End Gear Drive)

## GENERAL SPECIFICATIONS ALL MODELS

	Ind. 30	Ind. 31	Ind. 32	Ind. 33	Ind. 52	Ind. 56
No. of Cylinders	6	6	6	6	8	8
Type of Engine—4 Cycle	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Bore—Inches	3 1/4	3 1/4	3 7/8	3 7/8	3 7/8	3 13/16
Stroke—Inches	4 5/8	4 5/8	4 3/4	4 3/4	3 1/4	3 3/8
Displacement—Cu. In.	230	230	265	265	270	331
Compression Ratio	7.0	7.0	6.8	6.8	7.5	7.5
Valves—Arrangement	L	L	L	L	Vee	Vee
Pistons—No. Rings	4	4	4	4	3	3
Crankshaft—Bearings	4	4	4	4	5	5
Camshaft Drive	Silent Chain	Gear	Silent Chain	Gear	Silent Chain	Silent Chain
Camshaft—Bearings	4	4	4	4	5	5
Crankshaft—Bearing Diameter	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 3/8"	2 1/2"
Lubrication—Type	Press.	Press.	Press.	Press.	Press.	Press.
Lubrication—Type Oil Pump	Rotor	Rotor	Rotor	Rotor	Rotor	Rotor
Lubrication—Oil Capacity Qts.	5	5	5	5	5	5
Ignition—Battery Type	Yes	Yes	Yes	Yes	Yes	Yes
Spark Plug—Size	14 mm	14 mm	14 mm	14 mm	14 mm	14 mm
Starting—Elec. Type	6 Volt	6 Volt	6 Volt	6 Volt	6 Volt	6 Volt
Gen. Reg.—Full Voltage	45 Amps.	45 Amps.	45 Amps.	45 Amps.	45 Amps.	45 Amps.
Gen. Reg.—Full Voltage and Current Control	Yes	Yes	Yes	Yes	Yes	Yes
Carburetor—Type	Down-Draft	Down-Draft	Down-Draft	Down-Draft	Down-Draft	Down-Draft
Fuel Pump	Yes	Yes	Yes	Yes	Yes	Yes
Weight—Approx. (Lbs.)	575	610	740	760	591	845

Specifications subject to change without notice.

#### HORSEPOWER



**CHRYSLER INDUSTRIAL ENGINES**  
INDUSTRIAL ENGINE DIVISION • CHRYSLER CORPORATION

Circle No. 32 on Reader Service Card for more information



## Unload 2 tons with 1 hand

It's easy with a Roura Self-Dumping Hopper. Simple, one-man operation does it with amazing speed . . . cuts cost of hand unloading by at least 50%. That's why hundreds of leading industries have found it the safe, sensible, economical way to handle wet or dry, hot or cold bulky materials.

It fits securely on any standard fork or platform lift truck . . . turns it into an efficient, semi-automatic dump truck. And, remember . . . Roura makes 'em rugged . . . extra heavy gauge welded construction . . . to withstand years of toughest treatment. They're available in sizes from  $\frac{1}{2}$  to 2 cubic yards.

Let Roura help you cut costs.

## ROURA *Self-Dumping* HOPPER

### WANT DETAILS?

Clip this coupon . . . attach it to your letter-head . . . sign your name . . . and mail to . . .

**ROURA IRON WORKS, INC.**

1411 Woodland Ave., Detroit 11, Michigan

Circle 126 on Reader Service Card

46



HULLABALOO about increasing mechanization is being whipped up to a new froth as an important election year approaches. Labor, management, Government, the Clergy, and even the housewife are having a say on the subject.

As we've deplored so many times, the word "automation" has come to mean too many things to too many people. Its true meaning has been almost lost through twisted interpretations.

Don G. Mitchell, Chairman and President of Sylvania Electric Products, stressed a basic principle recently. Speaking before the Subcommittee on Economic Stabilization of the Joint Congressional Committee on the Economic Report, he pointed out the dangers—clearly recognized by other industrial leaders, military planning experts, and clear-thinking labor heads—of an imminent, serious shortage of skilled production personnel. Increased utilization of mechanization has already met unprecedented public demands for goods and services, he stated, and it will have to be stepped up from here on if dangerous labor shortages are to be averted.

General Mills' Dr. Cleo Brunnert told the same congressional group about the many new skills and jobs that mechanization has created in his company. He urged that industry and labor unions join forces to meet the changes automation is bringing.

Job definitions, factual information, education and training, and establishment of sound skill evaluation procedures were included in a program he recommended to prevent short term dislocations where industries are not prepared for increases in mechanization—which must come if they are to stay in business.

IF YOU NEED CASTERS,  
IT WILL PAY YOU TO

**Specify**  
**DARNELL**

**CASTERS • WHEELS**



*Here's Why*

RUBBER TREADS . . . a wide choice of treads suited to all types of floors, including Darnellprene oil, water and chemical-resistant treads, make Darnell Casters and Wheels highly adapted to rough usage.

RUST-PROOFED . . . by zinc plating, Darnell Casters give longer, care-free life wherever water, steam and corroding chemicals are freely used.

LUBRICATION . . . all swivel and wheel bearings are factory packed with a high quality grease that "stands up" under attack by heat and water. Quick grease-gun lubrication provides easy maintenance.

STRING GUARDS . . . Even though string and ravelings may wind around the hub, these string guards insure easy rolling at all times.



**DARNELL CORP., LTD.**  
DOWNEY, (Los Angeles County) CALIF.

60 Walker Street, New York 13, N.Y.  
36 North Clinton, Chicago 6, Illinois

Circle No. 40 on Reader Service Card  
**FLOW**

# B.F. Goodrich



**ANALYSIS boosts tire life in every  
department of Dana Corporation**



**Unloading 2 tons** of clutch plate castings at Dana receiving dept.



**7200 pounds of castings** on their way to the production line.



**Stored synchronizing rings** outside the heat treating dept.



**A load of Dana transmissions** arrives in shipping department.

THE Dana Corporation manufactures truck and bus transmissions in its Toledo, Ohio, plant. Materials handling equipment is used to haul supplies, parts and finished transmissions all over the factory, from receiving room to shipping department. Tires roll through storage yards, over oil-soaked floors, over sharp steel shavings.

Here was a job for the B. F. Goodrich Tire and Wheel Analysis man. He studied Dana's equipment, loads and hauling surfaces. Then he recommended the right tire types, sizes, tread designs and tread compounds. Garage-man Anthony Bosch says he's had tires that didn't last half as long as those

recommended by the B. F. Goodrich TW Analysis man.

### **How about a FREE TW Analysis for you?**

Dana Corporation's case is not unusual. The B. F. Goodrich FREE Tire and Wheel Analysis is saving time and money for industrial tire users all over the country.

How about *you*? Just call your local B. F. Goodrich retailer or mail the coupon. This no-obligation Analysis includes money-saving maintenance tips as well as tire recommendations. You can be sure the advice you get is unbiased, because B. F. Goodrich

Circle No. 70 on Reader Service Card for more information

makes a *complete* line of industrial tires. Act now! And if you manufacture materials handling equipment, there's a special TW Analysis for you.

### **Specify B. F. Goodrich tires when you order new equipment**



The B. F. Goodrich Company  
Tire & Equipment Division  
Department TW-552,  
Akron 18, Ohio

Please send me:  
 Additional information on your Tire and Wheel Analysis Plan  
 Free copy of "Industrial Tire Guidebook"  
 Free copy of "How to Get Extra Service out of Solid Industrial Tires"

Name \_\_\_\_\_

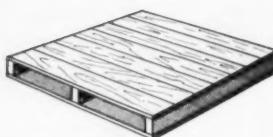
Company \_\_\_\_\_

Street \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_



**Skids?**



**Pallets?**

## HANDLE 'EM BOTH



with



*Lightweight*

### HAND PALLET TRUCK with SKID ADAPTER

Why buy one hand truck for skids . . . another for pallets . . . when this RAYMOND Lift Truck will handle them both!

This RAYMOND Pallet Truck is now available with a hinged superstructure for handling skid loads.

The superstructure raises out of the way when your load is on pallets . . . lowers into position when you're handling skids. It cuts hand truck costs in half for dual skid and pallet handling . . . ideal when converting from skid to pallet operation.

The RAYMOND Hydraulic Truck is lightweight . . . thanks to its aluminum alloy construction . . . yet plenty rugged to provide years of use. It's highly maneuverable, easy to pull, has foot pedals for lifting and lowering loads. Capacity: 2,000 lbs.

### The RAYMOND CORPORATION

3358 Madison St., Greene, N.Y.

- Please send details on Hand Pallet Truck with Skid Adapter.
- Please send me latest RAYMOND Hydraulic Equipment Catalog.

NAME \_\_\_\_\_ TITLE \_\_\_\_\_

COMPANY \_\_\_\_\_

STREET \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_

### WRITE FOR DETAILS

Circle No. 122 on Reader Service Card for more information



• Russell L. Sears has resigned as vice president and general sales manager of Lynch Corporation to assume new duties as executive director of the Packaging Machinery Manufacturers Institute, Inc. In his new capacity, Sears will coordinate trade association activities of the 70 member companies which manufacture automatic packaging machinery, and will serve as director of the P.M.M.I. exposition of 1956, scheduled for September.



R. L. Sears

• Emphasis will be placed on glassware and closures, metal and fibre cans, and collapsible tubes, at the next scheduled clinic on packaging materials sponsored by the American Management Association. The clinic will be held February 14-16 in New York City.

• Highlights of the Sixth National Conference on Standards included an address by Thomas P. Pike, assistant secretary of Defense, Supply and Logistics, titled "Government-Industry Cooperation in Standardization", which was the theme of the conference held in Washington, D. C., October 24-26. Sponsored jointly by the American Standards Association and the National Bureau of Standards, leaders from industry and government heard discussions on international standards and legal implications of standardization, and toured the National Bureau of Standards.

## ASSOCIATIONS

*Continued*

• Standards were the main topic under discussion by members of the Caster and Floor truck Manufacturers' Association, meeting in Cleveland October 18-20. The group heard an economic forecast of business conditions in 1956, delivered by James M. Dawson, vice president and economist of the National City Bank of Cleveland, and discussed plans for an Industry promotional, educational and advertising program.

• New members of The Material Handling Institute, Inc. are David Round & Son, Inc., Cleveland, and Modern Caster Company, Rockford, Illinois. T. H. Round and Richard J. Benson will represent their respective companies.

• Establishment of five subcommittees to assist in the work of the Exhibitors Advisory Committee for the 25th National Packaging Exposition has been announced by the American Management Association, sponsor of the trade show. The special committees were created to find out the views and reactions of exhibitors at the April 9-12 Show scheduled for Atlantic City's Convention Hall. The association's National Packaging Conference to run concurrently, will feature industrial and consumer packaging problems and suggested solutions.

• Theme of the technical sessions sponsored by the American Material Handling Society during the Material Handling Institute's Exposition of 1956 will be "Integrated Handling—Management Profit Tool". The sessions will deal with work measurement, cost analysis, automation, work simplification, plant layout, traffic management, and distribution. The event is scheduled for June 5-7 in Cleveland's Public Auditorium.



ELECTRIC INDUSTRIAL TRUCKS • HYDRAULIC ELEVATING EQUIPMENT

### The RAYMOND CORPORATION

3333 Madison St., Greene, N.Y.

( ) Please send me latest Reach-Fork Bulletin.

( ) Please have a Raymond representative call.

NAME \_\_\_\_\_ TITLE \_\_\_\_\_

COMPANY \_\_\_\_\_

STREET \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_

Circle No. 123 on Reader Service Card for more information

# frame it with DEXION!

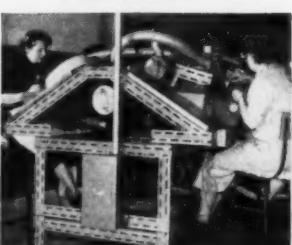
New "DO-IT-YOURSELF" framing material has scores of applications in your plant



TESTING BENCH



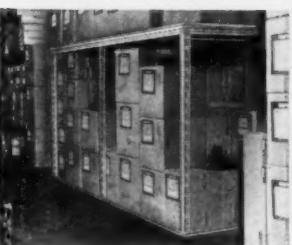
STAIRWAY



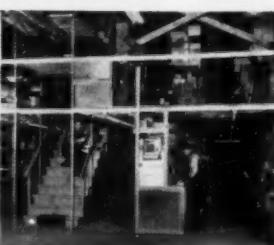
WORK BENCH



MAINTENANCE PLATFORM



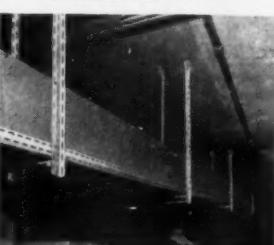
STORAGE BINS



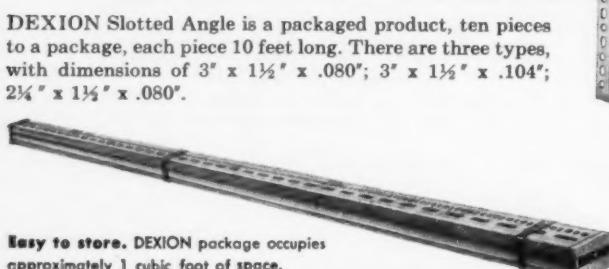
MEZZANINE FLOOR



GOODS CART



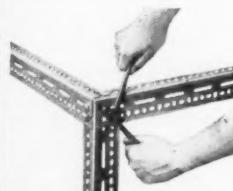
FRAMEWORK CONVEYOR



Easy to store. DEXION package occupies approximately 1 cubic foot of space.

Here's why you'll want DEXION Slotted Angle over any other framing material

Anyone who can handle a wrench and a saw (or Dexion Cutter) can build with this precision-made, galvanized steel angle. And DEXION is so easy to use or re-use! There's no drilling—no welding—no waste. DEXION is strong and rigid—lasts a lifetime—and the price is amazingly low.



Simple to connect. All you need are two wrenches. No special parts—no training necessary.



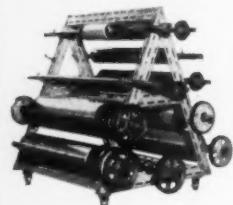
Easy to cut. One down-stroke of DEXION cutter saves time and work.



Re-usable. You can dismantle and rebuild into other equipment.



Easy to measure. Diamond-shaped cutting marks spaced 3" apart.



Strong and rigid. Will support many hundreds of pounds.



DEXION panels. Available for shelving to support heavy loads.

You name it—DEXION will frame it!

Get the exciting new DEXION IDEA BROCHURE, which gives you full information—and shows what scores of manufacturers are building with this amazing framing material. Write direct to the address shown below.

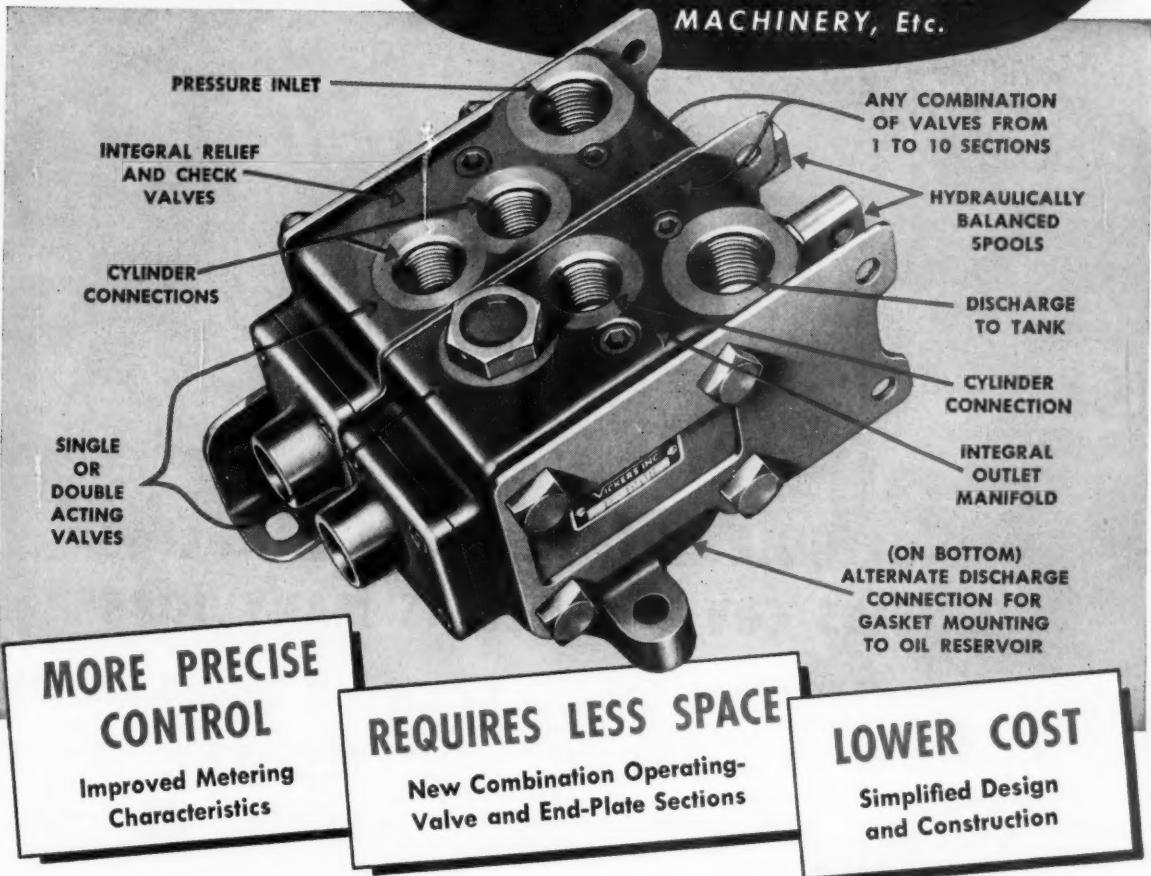
**DEXION DIVISION  
ACME STEEL COMPANY**

Dept. 12B, 2840 Archer Avenue,  
Chicago 8, Illinois



# NEW! Series CM11 VICKERS® MULTIPLE UNIT VALVES

For MATERIALS HANDLING EQUIPMENT,  
FARM TRACTORS, BUCKET LOADERS,  
CONSTRUCTION and MINING  
MACHINERY, Etc.



## MORE PRECISE CONTROL

Improved Metering Characteristics

## REQUIRES LESS SPACE

New Combination Operating-  
Valve and End-Plate Sections

## LOWER COST

Simplified Design  
and Construction

New, compact, more versatile design of valve. End sections combine in one casting the inlet or outlet manifold plate together with any operating-valve section. Inlet section also contains relief valve. Individual outlet plates available for single unit valves. Single- and double-operating valve sections can be added between end sections as needed. Valve can be adapted for tandem (series) operation. Single-acting valves available for either direction of lever shift.

Other features include protection of pump from reverse flow during shifting . . . three point mounting for more simple installation . . . cylinder connections with 3/4-16 N.F.-2 straight threads (AND 10050 type) which conform to SAE standards help insure leak-proof connections . . .

6794

optional outlet ports in end section so valve can be gasket mounted to the oil reservoir or pipe connected. Designed for use with Vickers Series V-200 Vane Pumps (up to 11 gpm), the CM11 Valve can be used up to 2000 psi working pressure. For further information write for Installation Drawing M168643.

### VICKERS INCORPORATED

DIVISION OF SPERRY RAND CORPORATION

1538 OAKMAN BLVD. • DETROIT 32, MICH.

Application Engineering Offices: • ATLANTA • CHICAGO  
CINCINNATI • CLEVELAND • DETROIT • HOUSTON • LOS  
ANGELES AREA (El Segundo) • NEW YORK AREA (Summit,  
N. J.) • PHILADELPHIA AREA (Media) • PITTSBURGH  
AREA (Mt. Lebanon) • ROCHESTER • ROCKFORD • SAN  
FRANCISCO AREA (Berkeley) • SEATTLE • ST. LOUIS  
TULSA • WASHINGTON • WORCESTER

IN CANADA: Vickers-Sperry of Canada, Ltd., Toronto

ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921

Circle No. 154 on Reader Service Card for more information

DECEMBER, 1955



G-E base station located in superintendent's office dispatches orders, controls fleets of Douglas material handling units. Vehicles handle 2 times as many jobs as before.

\*

Request for new assignment! Douglas G-E radio equipped tractor is in constant contact with supervisors and other vehicles. Speaker on dash overrides factory noise.



## RADIO-EQUIPPED MATERIALS HANDLING VEHICLES COVER TWICE AS MANY JOBS

### Douglas Aircraft Finds G-E 2-Way Radio Cuts Time Between Jobs, Coordinates Facilities, And Saves Money

A profitable materials handling operation depends upon efficient control, and maximum use of all equipment. General Electric 2-way radio helps the Douglas Aircraft Company do this—and saves them money.

#### RADIO COORDINATES OPERATION

This world-famous builder of military and civilian aircraft has radio on handling vehicles in its Santa Monica plant. Radio-equipped fork trucks, cranes, and tractors on the job at Douglas are in constant contact with dispatcher, and each other. Wherever a vehicle is working—in a remote building, at a loading dock outdoors, anywhere, in this 147 acre plant—the operator is under supervision, can get new orders instantly.

#### SURVEY PROVES RADIO ECONOMY

In one study of radio efficiency on

crane type units alone, Douglas management found that radio had reduced travel distance per job tremendously. Previously, up to 60% deadhead travel had been the case—with radio, these vehicles may handle 2 times as many jobs. On this basis, G-E radio can pay for itself in record time.

#### G-E LOW POWER SYSTEM

The base station transmitter is located in the transportation supervisor's office. Mobile two-way radios are on vehicles equipped with large speakers to over-ride high factory noise levels. G-E industrial radio may be operated from any of the five DC voltage systems used by handling vehicles. Mobile units perform on either 6 or 12 volt power supplies—

converters are used for 24, 32, and 64 volt trucks. Units operating inside steel buildings and in the open prove the effectiveness of the Low Power radio at Douglas.



#### INVESTIGATE G-E RADIO

A G-E Communications Counselor can show you the outstanding versatility, sturdy construction, low maintenance features of G-E Industrial Radio. Call him in, or write today to: *General Electric Company, Communication Equipment, Section X32125, Electronics Park, Syracuse, New York.*

*Progress Is Our Most Important Product*

**GENERAL ELECTRIC**

Circle No. 64 on Reader Service Card for more information



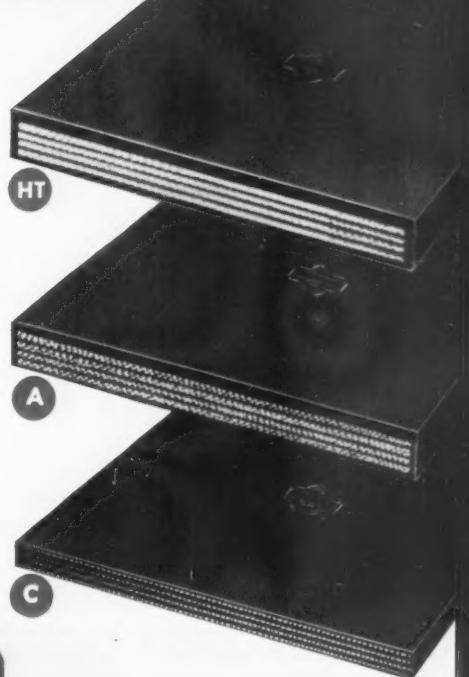
## Thermoid Conveyor Belting cuts handling costs in quarries



There's a Thermoid Conveyor Belt designed to lower your handling costs on every quarry job. Here are three examples: **HT** For extremely abrasive materials such as granite, trap rock, flint rock, quartz ore; **A** For slag, lime rock, crushed stone and other highly abrasive materials; **C** For moderate abrasives such as sand, loam, soda, gravel.

Thermoid's exclusive impregnation process welds carcass and cover into an exceptionally strong, durable belt. Finest quality reinforcement and specially compounded rubber stocks assure long life . . . lower your handling costs per ton. There is a complete line of Thermoid Conveyor Belting, Hose and Multi-V Belts for every quarrying application. Call your Thermoid Distributor for information, or write direct.

Circle No. 140 on Reader Service Card



Conveyor & Elevator Belting • Transmission Belting  
F.H.P. & Multiple V-Belts • Wrapped & Molded Hose

# Thermoid

Rubber Sheet Packings • Molded Products  
Industrial Brake Linings and Friction Materials

Thermoid Company • Offices & Factories: Trenton, N. J., Nephi, Utah

# MEN in the NEWS



Elmer F. Twyman



John D. Baldinger

At Yale & Towne Manufacturing Co. . . . Enlargement of the corporate executive organization was announced by President **Gilbert W. Chapman**. Vice President and Director **Elmer F. Twyman**, who had also served as general manager of the Yale Materials Handling Division at Philadelphia, will make his headquarters at the corporate executive offices in the Chrysler Building, New York City, where he will coordinate all domestic material handling operations. **John A. Baldinger**, who has been serving since 1951 as general manager of the Automatic Transportation Company Division in Chicago, has been appointed general manager of the Yale Materials Handling Division in Philadelphia. A graduate of Harvard University School of Business Administration, Baldinger joined Yale & Towne in 1945, prior to which time he was associated with Whiting Corporation.



Roy L. Wolter

sales manager. Wolter joined Automatic in 1918 when the company was still at Buffalo, New York, where he was studying at the University of Buffalo. He served in a number of executive, manufacturing and engineering capacities, and

At Automatic Transportation Co. . . . **Roy L. Wolter**, former midwest regional sales manager of Yale industrial trucks, has been appointed general manager of this Division of Yale & Towne Manufacturing Co. which he previously served for 30 years, 13 of them as general

in 1948 was transferred to the Yale Materials Handling Division.



Ivan E. Howard

At Lamson Mobilift Corp. . . . **Ivan E. Howard**, former general service manager of Clark Equipment Company, has been named manager of the Cleveland district office. In this capacity Howard will have charge of sales and service in Ohio, western New York, western Pennsylvania, Kentucky, West Virginia and Michigan.

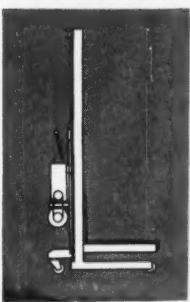
At The Electric Storage Battery Co. . . . Patent award checks for improvements in storage batteries were presented **Howard Stoertz** and **Curtis C. Wallace** by President **C. F. Norberg**. The awards are based on value of the patents to the company. Both men hold several U.S. patents in the storage battery field and are members of the American Chemical Society, American Institute of Chemical Engineers and Franklin Institute of Philadelphia.

Three material handling engineers were recently singled out by Pittsburgh Steel Products Co. to cover important marketing areas. **John Paul Bourbeau** was assigned the New York territory, **Robert K. Lohman** was named to handle sales in 11 Midwestern states from headquarters in Chicago, and **Russel H. Nutter** was appointed to cover Michigan and Toledo, Ohio, with headquarters in Detroit.

(Continued on page 56)



*Shown at left  
is Uplifter  
loading high-  
way truck.*



*Revolvator  
Uplifters:*

*1000 lb.\*  
capacity —  
platform  
length 24",  
platform  
width 24",  
lift 62".*

*2000 lb.\*  
capacity — plat-  
form length  
30", platform  
width 30",  
lift 65".*

## **REVOLVATOR UPLIFTER PORTABLE ELEVATORS**

**you benefit by over 50 years of experience**

Multiple use, multiple purpose Revolvator Uplifters, products of 50 years of engineering know-how, solve handling problems throughout all industry. Ideal for shop usage, Revolvator Uplifters also speed handling in the shipping department with equal efficiency. The Uplifter is ideal when no shipping dock is available. Electrically-powered Uplifter portable elevators are available in either "plug-in" or battery operated models. Platform and load are lifted by means of a

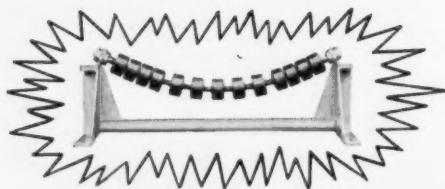
highly efficient motor-driven pump, activating a hydraulic ram and two roller chains, guaranteeing safety and ease of operation. Zee bar construction in uprights assures no sway, no binding of the rollers. Today write for full information.

**REVOLVATOR CO.**

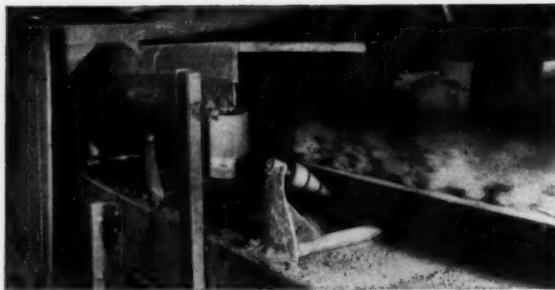
8739 TONNELE AVE., NORTH BERGEN, N. J.

*\*Also available in dual capacity hand-operated models.*

Circle No. 124 on Reader Service Card for more information



*Where There's ABRASION or CORROSION*  
**... This JOY IDLER  
 OUTLASTS THEM ALL!**



**SHAPES TO THE LOAD . . . CUSHIONS, GUIDES BELT**

The unique Joy Limberoller Conveyor Idler consists of neoprene discs molded on flexible steel cable. It's suspended from two bearings—one at either end, *up out of the dirt zone*. Illustrated is an installation in a dusty coke plant. In another typical job, handling abrasive foundry sand, Joy units have lasted *10 times longer* than any previous idlers and are still going strong.

Conveyor efficiency is assured and maintenance is a breeze when you switch to these Joy idlers. They exert a cushioned grip that supports the loaded belt without slipping, and keeps belt wear to a minimum. They're easier, faster and less costly to install, maintain, knock down and move than any other conveyor idler on the market, and are available for belt widths of 18", 24", 30" and 36". • Get the details! **Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa.** In Canada: **Joy Manufacturing Company (Canada) Limited, Galt, Ontario.**

**OTHER ADVANTAGES:**

- Resists corrosion, abrasion, flame, grease • Weighs  $\frac{3}{4}$  less than steel idler • Handles both bulk and packaged materials • Easily changed without stopping belt • Compactly stored • Saves handling time



**Write for  
 FREE Bulletin 25-42**

Gives complete details on the unique Joy Limberoller.  
 Circle 88 on Reader Service Card for more information



**MEN IN THE NEWS . . .**

(Continued from page 54)



**Alvin Amos**

**At The Deluxe Metal Furniture Co. . . . Alvin Amos** has been named plant manager of this subsidiary of Royal Metal Manufacturing Co. He has been associated with the company for the past three years, prior to which time he was employed by E. W. Bliss Company of Canton, Ohio.

**At Borroughs Manufacturing Co. . . .** The board of directors has elected **George Bennett** president and **Tracy Call** treasurer and secretary. Bennett was formerly general manager and Call former controller of the company.

A four story building located at 206-08 South Front Street has been purchased by the **H. G. Hanline Company** of Philadelphia. The move was said to be necessary due to an increase in the firm's stitching wire and box strapping business, and also their recent purchase of the U. S. rights, title, trade-mark, patents and formulae of the Alpha and Opalac marking and stenciling inks from Binney and Smith Company.

**Modern Handling Equipment Company**, 4260 Sansom Street, Philadelphia, was named **Hyster Company** distributor as of November 1. The firm maintains branch operations in York and Allentown, and is managed by **J. S. Grimson** and **J. McEwen**.

East-central Missouri and certain counties in Illinois comprise the sales territory recently assigned **St. Louis Heil Equipment Company** by **The Heil Company**. The distributor is located at 2002 Woodson Road, Overland, Missouri.

A newly formed organization headed by **Carl E. Thorkelson** and **Garth Owen** was appointed Chicago area representative by **Republic Steel Corporation**. The new company, located at 4754 West Washington Blvd., will specialize in containers and container systems.

**Equipment For Industry**, 7512 Carnegie Avenue, Cleveland, has been appointed northern Ohio distributor for **Rack Engineering Company**.

# Which Truck is Best for Your Needs?

GAS  
TRUCK

ELECTRIC  
TRUCK

DIESEL  
TRUCK

LP-GAS  
TRUCK

HAND LIFT  
TRUCK

# Yale Makes Them All!

...and there's a Yale Truck with the capacity you need from 1000 to 100,000 lbs.

YALE has a Truck with fuel, capacity, and interchangeable attachments . . . exactly suited to your particular handling needs. And, every YALE Truck is quality built . . . designed to save time, space, manpower . . . slash handling costs as much as 75%.

#### OPERATOR TRAINING TO FIT YOUR REQUIREMENTS

can mean reduced maintenance costs, longer truck life, and substantial production economies through proper use. Ask our representative about this comprehensive YALE service . . . and ask him about the new Finance-Lease Plan for acquiring YALE equipment.

#### SHOWN HERE ►

is a YALE Fork Lift Gas Truck.  
It maneuvers smoothly in close quarters . . . stacks heavy loads ceiling high.

**YALE\***  
INDUSTRIAL LIFT TRUCKS  
AND HOISTS

\*Reg. U. S. Pat. Off.



The YALE & TOWNE Mfg. Co., Dept. 412  
Roosevelt Boulevard, Phila. 15, Pa.

Please send me the Picture Story of Yale

Materials Handling Equipment

Please have local YALE Representative call

Company \_\_\_\_\_ Title \_\_\_\_\_

Name \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_

Street \_\_\_\_\_

In Canada write: The Yale & Towne Manufacturing Company

St. Catharines, Ontario, Canada

Gas, Electric, Diesel & LP-Gas Industrial Trucks • Worksavers • Hand Trucks • Hand & Electric Hoists • Pul-Lifts

Circle No. 162 on Reader Service Card for more information

DECEMBER, 1955



## *Traveloader*... revolutionizes long load handling!

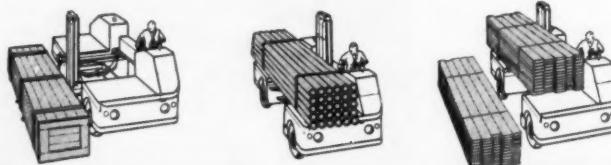
Here at last is a practical answer to the awkward problems of yard handling and particularly those nightmarish long loads. Traveloader combines the unique ability to pick up, carry and stack long, unwieldy or multiple pallet loads—indoors or out. Operating over paved or unpaved roadways, it does the job fast, safely, and much cheaper than other equipment.

This one machine, with one operator, replaces two and often three fork trucks, portable cranes or straddle carriers, and does the job better. You save manpower, cost of buying and maintaining other expensive equipment, aisle space, and time. Because Traveloader loads from the side and carries loads lengthwise, it requires much less aisle space than fork trucks.

Unlike a straddle carrier, this new machine can stack up to 12 feet high. And when traveling, the load is nested safely aboard the Traveloader's deck, eliminating dangerous dangling and swaying of load, distributing load evenly over four large wheels, and making speeds up to 30 MPH practical and safe.

*Write for descriptive bulletin No. 1360.*

ONLY  
TRAVELOADER



Picks up like a straddle truck • Delivers like a highway truck • Stacks like a fork truck

**Baker®**

handling equipment

**THE BAKER-RAULANG COMPANY**

1219 WEST 80th STREET • CLEVELAND 2, OHIO

A subsidiary of Otis Elevator Company



## SAFETY-ENGINEERED HANDLING

ACCORDING to various estimates, material handling is said to be responsible for some 22 to 33 percent of all industrial accidents. This, of course, amounts to a staggering total of dollars for compensation claims every year. Certainly we are all interested in reducing this to a minimum.

More important, however, in considering this problem, is the social angle—the maimed and injured, the widow and the orphan—in this appalling situation.

When we combine machines and men working together, we immediately establish a potential for accidents. Machines break down at times. So also does the eternal vigilance that men must use to maintain mastery of these machines. Statistics will prove that human failure by far exceeds mechanical failure.

For material handling equipment, a program of preventive maintenance, properly administrated and enforced, can hold machine breakdown to a minimum. Training operators to immediately stop their machines, at the first sign of mechanical failure, is easily done.

But make sure that the operator who comes up with a story of a possible machine breakdown gets the immediate attention of the maintenance department and not a brush-off! He believes in the safety program only as much as his management does, and only prompt action on his reports will keep him believing.

Training and education can produce a highly skilled operator. This, of course, is tremendously important to any safety program. Complete knowledge of the operation of the machine, of its capacities and its limitations, is invaluable.

So we have our safety program, our preventive maintenance and our operator training program. We are doing fine.

But one morning a man comes to work. He's been up all night with a sick wife or child. Or his wife or child is in the hospital. Or he owes a debt that he is not able to pay. Or it could be a thousand and one other things. And he starts to work operating a piece of equipment that could snuff out his life or the life of anyone in range in seconds. If for one split second his mind wanders. . . .

It must, therefore, be accepted that no matter how good the safety program, or how well enforced . . . no matter how good the equipment, or how well main-

(More on next page)



J. W. Hall

# Plan Handling To Check Human Failures

By J. W. Hall,  
National President,  
American Material Handling Society  
and  
Supervisor, Material Handling,  
Yards—Porters, Westinghouse Electric Corp.,  
Meter Division, Newark, N. J.

## PLAN HANDLING TO CHECK HUMAN FAILURES

Continued

tained . . . no matter how good the training and education program, or how skilled the operator . . . all of our equipment is operated by human beings, with human faults and failings.

Therein, lies our greatest problem.

It would seem to be in order that our whole program of industrial safety begin in the plant layout and design stage. Instituting safe practices into an established operation, however unsafe it has previously been, is generally done after the fact. It is necessary that every material handling operation involved in the layout be *properly evaluated* as to the type of material to be moved, the method, and the equipment needed to do the operation.

### "Safety and good material handling go hand-in-hand."

Of course, the old saying is "good handling is no handling". This is an admirable way to solve all problems. But it could also be said, "No handling—no business"! Copper in Peru cannot be used in a manufacturing plant in Buffalo, N. Y. It must be brought to the point of use in the form in which it can be used. This, until some inspired genius of the push-buttons comes along with something better, will still involve handling. Thus, it will suit us better to gaze upon today's machines and today's equipment and pick the type most suited to the operation to be performed on the present market. Let's not hold on to the old, unsafe equipment or methods—waiting for the revolution, or evolution, to solve all our problems.

Materials must be moved quickly, cheaply and safely. The right type of equipment, properly installed, will do the desired job quicker, cheaper and more safely than any haphazard conglomeration.

Basic to the whole safety program is the plant layout, building design, platform, aisles, etc. Safety should also, where possible, influence the design of dangerous-to-handle products. A plant which is laid out to facilitate the handling of materials is generally a safe plant to work in. Safety and good material handling go hand-in-hand.

Some plants, because of the product involved, the uniformity of the package and the volume, have been able to develop a very fine mechanical handling system

—which processes, wraps and packages the product, flows the packages along lines of conveyor to pallet loaders, drops the loaded pallet mechanically to a lower floor where a lift truck stacks in a warehouse. Good handling, yes, but unfortunately we all do not handle the type of product which lends itself to these methods.

Today, the types of material handling equipment available, if used as intended, or if designed for the handling operation, should help to make the job safe in spite of the human element. Straddle carriers, fork lift trucks, air tubes, pneumatic, belt, bucket, slat and other types of conveyors, walkie trucks—the list is endless—are available to us. There is no piece of equipment yet designed that does not do some one particular operation better than any other. In its own area of operation, it will be unbeatable by today's standards. But this does not make it 100 percent effective for all operations.

In plant layout and engineering work, close attention to the problem of *better* handling of materials will insure that the *correct* equipment is being used for the purpose for which it was *originally designed*. Into the original design of this handling equipment safety has been engineered by the manufacturer—based on the experience he has had in the installation and operation of such equipment over a period long enough to enable him to compile a history of the good and bad features of his product. He, as well as you, will be interested in making his equipment the finest and safest on the market. Generally, the manufacturers strongly stress the safety features of their products as sales points.

A plant safety program, if it is to operate properly, must be headed by a supervisor of safety who will: (1) Have the authority to suggest—or *demand* if necessary—prompt correction of unsafe practices or methods; (2) Keep a detailed history of the causes and effects of every accident; and (3) Head a team of safety observers picked from shop personnel to cover all departments and locations.

He must demand written reports of accidents, the cause and the remedy and see that the proposed corrective action is carried out. He must conduct a training program for all safety observers and supervisory personnel to insure their complete knowledge of the operating procedures.

### Compensation Awards To Widows With Children In Death Cases (Example from a Typical State)

Compensation Awards to widows with children in death cases. (Examples from typical industrial state.)

Widows with Dependent Children	Number of Cases	Number of Children	Estimated Present Value of Awards	
			Total Amount	Average Per Case
All widows with children	251	531	\$4,405,439	\$17,552
Widows with one child	97	97	1,484,341	15,302
Widows with two children	85	170	1,511,331	17,780
Widows with three children	38	114	782,744	20,599
Widows with four children	19	76	366,459	19,287
Widows with five children	4	20	83,448	20,862
Widows with six children	4	24	87,723	21,931
Widows with seven children	2	14	47,483	23,742
Widows with eight children	2	16	41,910	20,955



## SAFETY-ENGINEERED HANDLING

# How Much Do Handling Accidents Cost?

By L. A. Faulkner, Supervisor, Industrial Plant Service  
Liberty Mutual Insurance Company

"It is certain that material handling accidents are costing American industry as much as, if not more than, any other single type of industrial injury."

**T**HREE have been many estimates made of the cost to American industry resulting from accidents in the handling of materials. Most can be justified on the basis of the original intent or purpose for which the estimate was developed.

Recently published figures indicated that about 22 percent of all compensable injuries occurred while handling materials. On this basis, therefore, it could be estimated that the wage loss, medical expense and insurance costs associated with handling accidents amounted to approximately \$250,000,000, and that the so-called "indirect" costs amounted to about \$150,000,000. Thus, for both the "specified" and "indirect" costs, the annual total was about \$400,000,000.

These are believed to be conservative estimates—there have been others that have been much higher.

It is difficult to determine which type of industrial injuries cost the most money. It is possible that falls or vehicle accidents involve somewhat greater costs in total—even though such accidents may be less frequent than those involving the handling of objects. Both falls and vehicle accidents more frequently result in death than do handling accidents. In death cases, costs are particularly high. It is certain, however, that material handling accidents are costing American industry as much as, if not more than, any other single type of industrial injury.

Analyses of accident occurrence data from many industries indicate a high percentage of material handling cases. The percentage varies somewhat with the nature of business, types and weight of materials handled in process. The fact remains, though, that in almost all industries the handling of objects causes more accidents than any one other type of industrial activity.

The "Analysis of Accidents in Typical Industries" (page 63) is a digest of accident occurrence studies prepared to show that prevention effort is warranted in the area of material handling. Statistics are not available to show specific accident costs per industry or accident cause. The percentage of accident types and number of days lost is, however, given for some industries. This emphasizes the point that, in most industries, the material handling accident prevention problem involves a high frequency and number of days lost. This usually results in a high cost potential. In some industries, machine accidents—while less frequent—result in individual higher-cost-cases because of the severity.

### ***"Management must be interested in more efficient and safer handling techniques"***

It has been estimated that about 90 percent of all industrial activity is some type of material handling. This includes manual handling of raw material and materials in process, and mechanical handling of materials.

Statistics available also show that 22 percent of all disabling injuries are a result of the handling of objects—and that 26 percent of all temporary total disability injuries result from the same cause.

It is obvious, therefore, that management must be interested in more efficient and safer material handling techniques. Management can, without a doubt, improve the accident experience by a careful analysis of the extent of the problem.

***(More on next page)***

Increasingly, material handling is becoming a major consideration in many plants. Reduced handling costs are at present the goal of many plant operators. Manufacturers of material handling equipment are constantly engineering new devices and developing novel applications. The field of material handling is expanding. The job of the safety engineer is to establish a basic conception of how he can use this approach most effectively. At the same time he must set up guides which will reduce the possibilities of his becoming entangled in propositions beyond the scope of accident prevention engineering.

### Manual Handling

In the manual handling of materials, exposure to accidents is somewhat in relation to the weight and size of the object to be moved, the height it is to be lifted, and the distance it must be transported.

Most lifting injuries occurring in manual handling result in strains to muscles, ligaments, or more delicate body parts. These strain exposures result from any of the following causes:

1. Lack of appropriate lifting or transporting equipment or devices.
2. Over-ambition on the part of either worker or supervisor for doing lifting jobs. Included in this cause are such things as "show-off" acts by workers, horseplay, and other unnecessary exposures.
3. Incorrect manual lifting and carrying technique.
4. Worker lifting more than his capacity.
5. Lack of coordination of effort between workers lifting together.
6. Cluttered aisles, floors, and stairs.
7. Failure to use mechanical devices provided.

### Mechanized Handling

Mechanized handling devices, no less than manual methods, pose serious safety problems. However, when mechanized devices are in use, strain accidents are minimized—while the incidence of falling object and collision accidents, crushing fingers and toes, increases significantly.

Injuries resulting from the operation of mechanical handling devices may usually be traced to:

1. Objects accidentally falling from carrier.
2. Inadequate training of operators.
3. Poor layout of plant facilities.
4. Horseplay.
5. Devices in use inadequate for the job.
6. Failure of operators to use available handling equipment.
7. Poor housekeeping.
8. Excess handling between or at work stations.
9. Handling equipment in poor condition.

All the conditions listed for both manual and mechanical material handling may be considered as accident exposures. That is, every time any object is handled, the risks of accident which apply to the method of handling immediately come into existence. These are not the only sources of accidents in either method; they do constitute the major causes.

Following are some conditions where—from an accident prevention basis—investigation of material handling methods is ordinarily warranted:

**A. Analysis of accident occurrence** indicates that there is a **high frequency of accidents** in a plant (or department or in connection with a specific operation)—arising from the handling of a particular type of material or object (kegs, bags, tote pans, castings into machines, bales, coils, etc.)

In such cases, there is a definite problem in which the need for improved handling methods is clear-cut. The job is to work out an economically sound utilization of improved methods to suit operating conditions and thereby eliminate the accident hazards.

**B. More than one person is regularly required** to lift or move a container or object—and we believe that there is a severe potential hazard (strains, bruises, burns, etc.) which might readily result in an accident due to human failure, unsafe practice, or unsafe working conditions (slippery floors, tripping hazards, elevation, etc.).

It is undoubtedly in order to investigate the possibility of installing improved handling procedures.

**C. One person is required to lift** or move regularly a load that is in excess of 70 pounds for a man, or 25 pounds for a woman.

We are warranted in studying the application of some handling aid to reduce the possibility of strain or other injury. (These figures of 70 and 25 pounds are, of course, taken out of the air. They are not intended to have any authoritative significance as to what constitutes a safe, maximum weight for anyone to lift. We have taken the weights noted above *only* as a starting point with the idea that where such lifts are encountered, it is in order to study them).

The speed or frequency, distance of transport, shape of object, position, reach height of lift, etc., are all factors which must be taken into consideration.

**D. Congestion of material in process** is causing unsafe working conditions, with accompanying accident hazards, and the lack of adequate provisions for handling material is the cause of such a condition.

There is a possibility that improved materials handling methods should be studied. It is often possible to clear up cluttered areas by providing equipment which makes it possible (a) to use remote storage areas . . . (b) to handle material in process in smaller lots with less floor area consumed at machine stations for temporary storage . . . and (c) for disposal of scrap and waste, etc. Improved housekeeping quite often may be obtained only by better handling.

*(Continued on page 94)*

# ANALYSIS OF ACCIDENTS IN TYPICAL INDUSTRIES

## WOODWORKING PLANTS



## LAUNDRIES



## DAIRIES



## RESTAURANTS



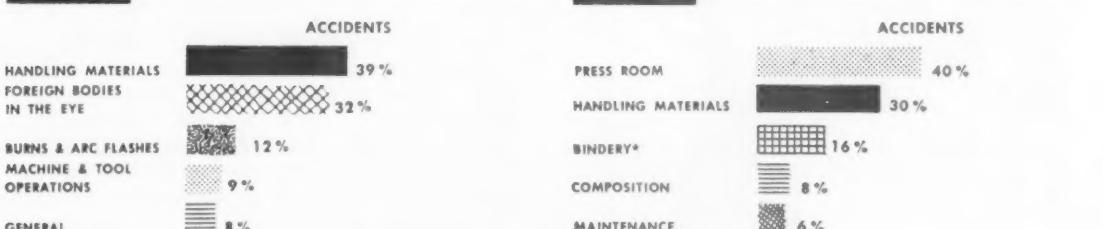
## BAKERIES



## MACHINE SHOPS



## WELDING



\*\*Includes falls as result of poor practices in connection with material handling and/or material handling equipment.

\*Includes falls due to bad housekeeping (materials left in aisles and around work areas.)

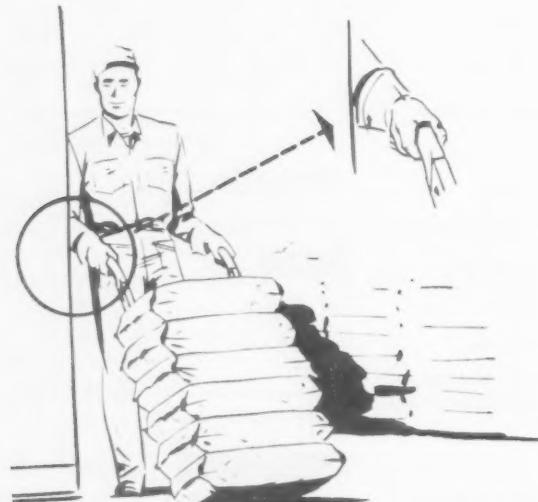
Watch for the fellow who isn't watching. Controlled speed permits fast stopping and easy turning.



# Safe Handling Manual Handling



**SAFETY  
ENGINEERED HANDLING**



Protect hands and wrists when going through doorways, past posts and girders.



WITHIN the general field of material handling, accidents may be traced to equipment breakdown, to incorrect use of equipment, to poorly trained operators, and, indeed, to the lack of use of equipment at all.

Many companies fail to realize that certain safety standards have recently been set up by the National Safety Council for the use of manually propelled handling equipment, just as have standards been publicized for powered industrial trucks. Accordingly, these simple rules for the safe use of non-powered equipment are too often overlooked.

We appreciate that a much smaller percentage of accidents is traceable to manually operated, over-the-floor equipment, as compared to other types of handling equipment. However, in view of the tremendous overall cost of handling accidents, an improvement, even in this phase of handling, would constitute a major gain for all of industry.

## "Home-Built" Equipment Dangerous

We feel that one of the greatest single causes of truck (manually operated) failure, with their accompanying accidents, stems from the practice of many firms to build such carriers in their own carpentry shops.

First, the average user, with limited facilities, cannot produce a truck of proper construction. While it is easy enough to build wheels or casters beneath it, the final product, the odds are, will most often be incorrectly designed. It may be the wheel styles or sizes are poorly chosen for no better reason than that they were the "easiest" for the inexperienced workmen to attach. Perhaps they are the right type and size but are improperly positioned.

Look ahead. An unexpected hole or object can pitch load forward, wreck a back.

# with Equipment

By H. Merrill Bowman,  
The American Pulley Company

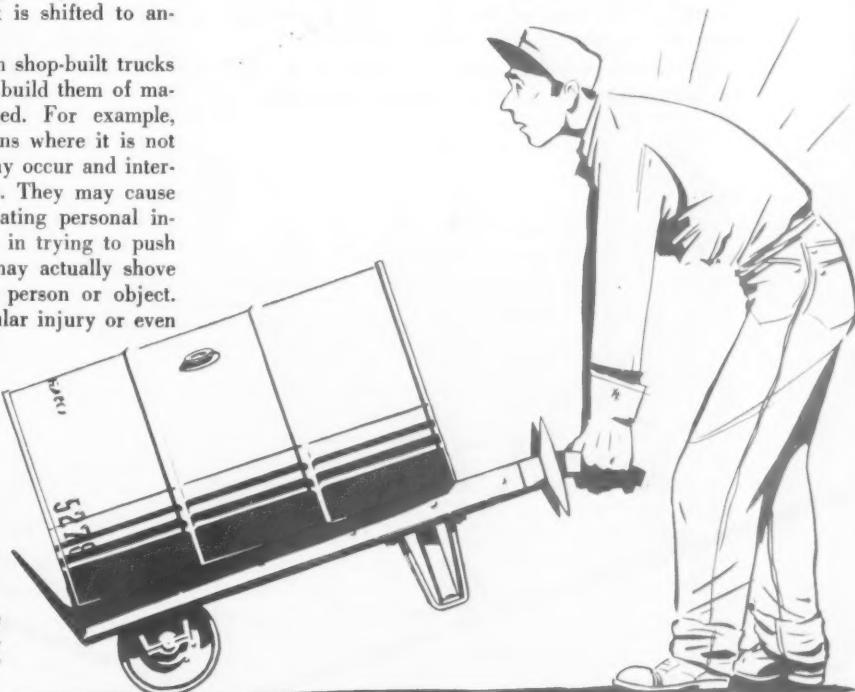
It may be that the shop-built truck conforms to measurements specified by someone who possesses inadequate knowledge of how to compute a turning radius or load capacity. Almost certainly, the shop-builder will choose such materials or so design the carrier that it is excessively heavy—without strength proportionate to its weight. This means that operators must push an unproductive load so great that it not only creates excessive fatigue and general inefficiency but may also make the vehicle uncontrollable at crucial moments. At the same time, the truck as a whole—or its components—may possess a strength wholly inadequate to do the job for which it was originally intended. This may cause a collapse or tip-over at some floor bump or other unexpected stress.

The danger of such accidents is increased, of course, when shop-built trucks are shifted from one job to another. Then there is lack of precise knowledge of either the theoretical or practical strength of the unit. Thus, successful operation on one job may easily create unjustified confidence when the truck is shifted to another job.

Another common safety hazard in shop-built trucks comes from the human tendency to build them of materials that are most easily worked. For example, wood is often chosen for applications where it is not best suited. As a result, splinters may occur and interfere when loads are slid into place. They may cause the operator to drop the load, creating personal injury, product damage, or both. Or in trying to push against the splinter, the operator may actually shove the truck itself against some other person or object. The trucker can easily suffer muscular injury or even a fracture in such a "struggle".



Loading bags, get chisel square with pile, drive until load is tight against rails. If it's cartons, get chisel firmly under but not tight against rails. Watch carton damage.



Weight should be balanced just  
behind wheels for easiest control.  
Truck need not be a back-breaker.

*Continued*

Yet, even when wood, for example, is wisely chosen, it may be inadequately fastened. It may be left without an outer steel rim to protect its ends, simply because there were no facilities in the carpentry shop to make such a rim and to fit it properly.

### Brakes Are Major Safety Factors

Another important consideration is truck brakes. The availability of brakes for hand-operated trucks has too long been overlooked as a major element of accident-prevention.

Simply because hand trucks are generally operated at walking speed, the fallacy has prevailed that the operator's own muscles, weight, and shoe-leather are invariably sufficient to provide all the braking action necessary. In many applications, they are completely adequate. But in countless other cases this is simply not so.

A truck, even though empty, may weigh, say, four hundred pounds, and be mounted on easy-rolling casters or wheels. Where it is moved down grades such as are common in many plants, it is often impossible for the average man to stop a truck, or even to keep it from accelerating to a dangerous speed. It should be evident that brakes are needed much more widely than most industrial managements suppose. Even a much lighter truck, if its load is heavy, should also have brakes to guard against operational hazards.

It is not only on slopes that brakes are helpful. Even on level floors, the momentum of a heavily laden truck may be far too great to permit a sudden stop, in the face of danger, unless mechanical brakes are provided. When reliance is to be placed upon brakes, it is doubly important that they be installed by mechanical experts, not by carpenters or plant "handy-men".

Still another value in obtaining trucks built with real know-how is the matter of operator psychology. It

originates in the operator's realization that the better truck is easier and safer for him to operate. This leads to a more responsible attitude toward the company, with higher productivity and the reduction of dangerous "cowboy" practices. The factor of pride is important toward safety when an operator recognizes his truck as a "snazzy job" that requires care.

### Important Design Selection Factors

In a more general attack on the problem of accident-prevention in relation to floor trucks, consider the major principles for selection of equipment.

The first involves the choice of the right truck for the job. The factors to be considered are bulk and weight of the load, its susceptibility to damage, and the manner in which the loading is to be done. If cargo is to be dropped with little regard for breakage, it is always advisable to choose a carrier with all-steel construction. Allowance also must be made for overloads and other extreme service conditions.

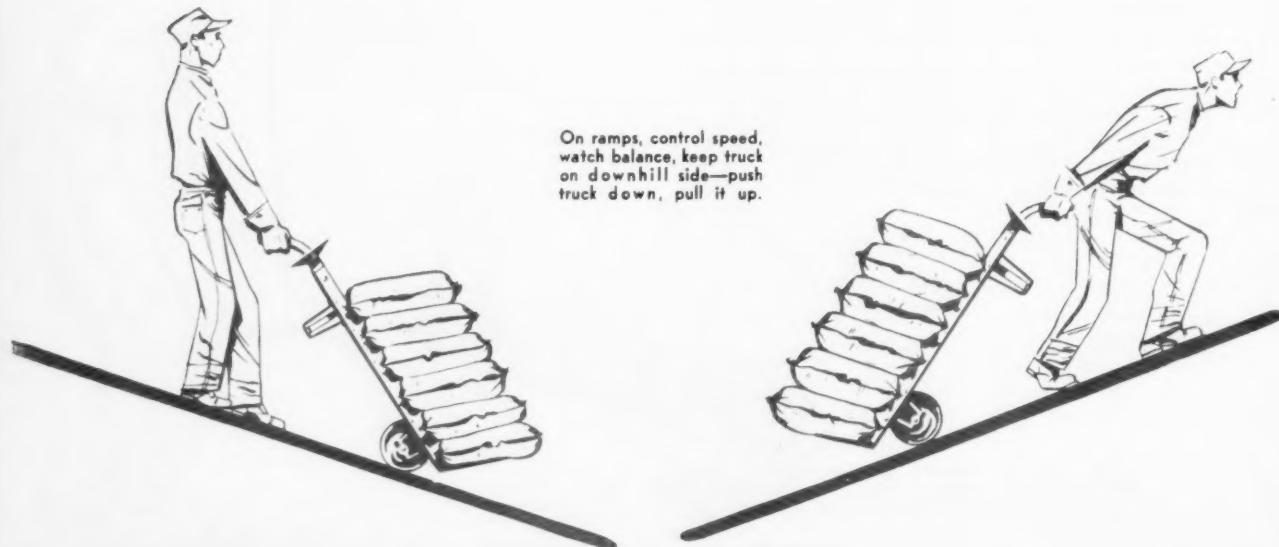
Another major consideration is the kind of floors over which the truck will operate. Here, the objective is simultaneously to protect the floors, the truck, and its load.

If floors are rough and rutted—have armor-plated runways, projecting door sills or rail cross-overs—wheels of large diameter will be important to safety as well as mobility. If floors are littered with material likely to damage rubber, the use of semi-steel or all-steel wheels may be required. Otherwise, rubber tires, either hard or pneumatic, are usually preferable.

Plain-bearing wheels are lower in first cost but result in the requirement of more force to propel a truck, a highly important factor in operator health and safety. Ball bearings are best for light to heavy-duty requirements; straight or tapered roller bearings are best for extremely heavy-duty demands.

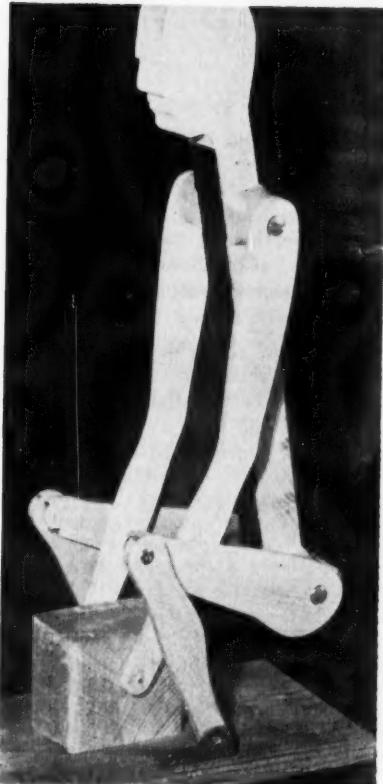
*(Continued on page 97)*

On ramps, control speed,  
watch balance, keep truck  
on downhill side—push  
truck down, pull it up.





SAFETY-ENGINEERED  
HANDLING



PROPER lifting, with object between feet, back straight, load on legs.



"JUNIOR" heads for trouble as the load—as well as his back—is in wrong position and vertebrae spread.

## Substitute Skill for "He-man" Complex

By Philip F. Pickett,  
Safety Engineer,  
Kemper Insurance, Chicago

**A**CCIDENTS resulting from the handling of materials—maybe mishandling or even manhandling are better words—constitute the greatest single cause of lost-time injuries in industry today.

Pointing up the seriousness of the problem are figures that show accidents resulting from the handling of material cause:

**6 percent** of the total fatalities and the permanent total injuries where persons are so crippled they never are able to return to work;

**21 percent** of the permanent partial disabilities—such as amputations and irreparable dislocations;

**25 percent** of the temporary total disabilities, more commonly known as lost-time injuries.

It's difficult to pin down more than the direct costs of an accident. Yet we at Kemper Insurance estimate that the indirect costs total as much as four times the direct costs in many cases.

As an example of how these hidden and indirect costs add up, take the case of a John P. Jones whose legs are crushed by a heavy box. All the employes in the immediate area gather 'round the scene. More employes take time off to watch when the ambulance arrives and Jones is carried off on the stretcher. As the word spreads through the shop, everyone has to take some time out to listen to each newly uncovered detail, to talk about "poor Jones", and to feel sorry for his family. Some eye witnesses may be so shaken they can't work at top efficiency for a while.

(More on next page)



**HAND PROTECTION** is essential for safe handling of many types of materials. Some jobs may call for protection of wrists, too. Insist on complete compliance.



**CORRECT** two-man lifting operation. It's important for balance that men in any team effort be close in size and physique. Otherwise, both may be hurt.

## Substitute Skill for "He Man" Complex

*Continued*

Add to these lost-time expenses the additional cost of training a man to handle Jones' work while he's off the job. Other costs might be that of replacing the material damaged in the accident, and that of production-line delay until someone again is handling Jones' work efficiently. These indirect costs could have been avoided with proper, safe handling.

### Cultivate Admiration for Ability

Perhaps the basic, underlying reason for the seriousness of the handling problem in industry is the "he-man complex." Since way back when, man has admired and desired physical strength. Although our society and culture have changed tremendously since the days of the Greeks and the Romans, the admiration they had for men of strength still is very much in evidence today.

So, the first step in coping with the handling problem is to deal with man's natural inclinations. Fortunately, we have another human element on our side—man's admiration for skill. While we have to admire the physical prowess of men engaged in sports such as football, baseball, boxing and wrestling, we realize they would not be great athletes without great skill.

In handling materials manually, skill is of utmost and of primary importance if the job is to be done safely. Small Orientals are able to lug on their backs huge packs that would tax the abilities of many bigger and stronger non-Orientals. This is evidence that more than strength is involved in being able to handle and lift objects.

The importance of skill has to be told, re-told and sold to all who handle materials manually. This means a program of education, sponsored by and supported by top company management. At regular meetings, the basic causes of handling accidents should be explained. Methods for the avoidance of these accidents should be discussed and demonstrated. The importance of skill must be stressed at all times.

We have found that employees respond fairly quickly to education programs geared to safety, in general, in a shop. We have also found that it takes an exceptional and well planned program to produce proper respect for the hazards involved in the handling of materials.

A companion step leading toward a solution of the problem—which also relies on the initiative of management—is a good program of safety engineering. A study of the handling procedure and the causes of accidents in a plant is more than likely to reveal unsafe working practices, uncover environmental hazards that can be eliminated, and point to areas where machines can be employed successfully to do the job.

In many cases where safety engineers for Lumbermens Mutual Casualty Company and American Mo-

torists Insurance Company have recommended areas for mechanical handling, the switch to machines has resulted in substantial savings.

In a study of several thousand accidents involving the mishandling of materials, we found the following:

Improper or unsafe lifting practices	...35 percent
Hands pinched by materials	...13 percent
Objects falling because of poor grip	...13 percent
Failure to wear safety shoes	...13 percent
Standing in unsafe and crowded areas	9 percent
Failure to wear hand protection	7 percent
Miscellaneous	10 percent

### Lifting Accidents

Lifting is involved directly in more than one-third of the material handling accidents and involved indirectly in many others. In some shops, the lifting accidents can be reduced by substituting machines for human muscles. But in establishments where machine handling is impossible or impractical, the job is mainly one of education and engineering.

One of our safety engineers was asked by the manager of a small California plant to find out why 89 men in the plant received serious hernia, strain and back injuries during just one year. The engineer found that: (1) foremen were requiring men to lift overly heavy boxes and other material by themselves; and (2) men didn't know the basic principles of proper lifting.

Complicating the picture was the fact that most of the workers were displaced persons who could speak or understand little English.

The engineer reported back to the home office. After studying the problem, we designed a robot that would show not only how to lift but also the proper positions of the back and legs during lifting.

We called our robot "Junior, the Lifting Robot." When our engineer took "Junior" to the plant, the workers were fascinated by him. Each was given a chance to manipulate the device, to make "Junior" lift, and to see body-load relationships. This also was a revelation to the plant foremen. The results were immediate. During the next few months, the plant had a reduction of 55 percent in lifting accidents.

In cases where workers do not know how to lift properly, very little success will come from a program that concentrates only on telling them the proper lifting methods—and/or on distributing reading material on lifting. They should be shown how to lift.

Of the accidents attributed to improper or unsafe lifting practices, 12.1 percent result from lifting in an awkward position. Another 11 percent result from lifting with the back instead of the legs.

Failure to use available mechanical equipment accounts for the remaining 11.5 percent.

Then, you're always bound to find cases such as the time one of our safety engineers was asked to look into an accident. Two of 10 men who were moving a

(Continued on page 132)



REGULAR meetings are essential to create respect for skill needed in safe handling. Safety Engineer Pickett diagrams safe practices at Skil Corp., Chicago.



PINCHEH HANDS can be avoided and product damage prevented—by either widening doors and passages or designing loads to suit plant restrictions.



**How to obtain the most . . .**

## Effective Use of Human Energy in Floor Truck Operations

**P**HYSIOLOGISTS have determined the most economical, horizontal force in pushing trucks. The optimal horizontal resistance is found to be approximately 32 pounds. The energy expenditure for overcoming a higher resistance is, of course, greater than the amount of energy involved in overcoming a lower resistance. But a lower as well as a higher resistance will decrease the efficiency of the truck operator.

It is not advisable to exceed this 32-pound horizontal resistance figure because an increase of, for example, 10 percent over it results in an increase in energy expenditure which is much greater than 10 percent. It is, in that case, usually advisable to break loads down into lower weight units (total truck and load)—to produce a decrease in energy expenditure—even though more trips may be necessary.

The following conclusions are based on efficiency measurement; the figures given are optimal values:

1. Pushing is more efficient than pulling.
2. Pulling is only recommended in case of poor visibility due to bulky loads. (It must be recognized that, under certain conditions, even though the trucker is in front of the truck, he is pushing the load. An example is the type of trucking operation (similar to a Chinese Rickshaw)

**HIGHLY SIGNIFICANT** data is being developed at the Hopkinton Research Center of the Loss Prevention Department of Liberty Mutual Insurance Company, Boston.

Dr. Willem S. Frederik, Director of Research, has produced scientific data on the human factors in material handling operations—which FLOW prints here through the courtesy of Liberty Mutual. Material from two reports prepared for the policyholder service by the Safety Engineers of the company are included. These reports are: "Effective Use of Human Energy With Four-Wheel Hand Trucks", and "Four-Wheel Hand Trucking on Ramps."

where the trucker is actually pushing on a horizontal bar or extended shafts on a stevedore truck.

3. The optimal horizontal resistance of a hand truck in motion is approximately 32 pounds.
4. The most economical walking speed of a trucker is approximately two miles per hour. More rapid movement will tend to increase fatigue.
5. The best average height of the horizontal pushing bar of a hand truck is approximately 30 to 40 inches above floor level.

### Floor Conditions

It is often overlooked that the energy necessary for keeping a truck in motion is a result of friction only.

The horizontal resistance of a truck in motion can easily be measured by pulling a truck by means of a scale-spring or dynamometer. This force equals:

$$f x (TW + LW)$$

$f$  = (Rolling) Friction Coefficient

$TW$  = Weight in Pounds of Empty Truck

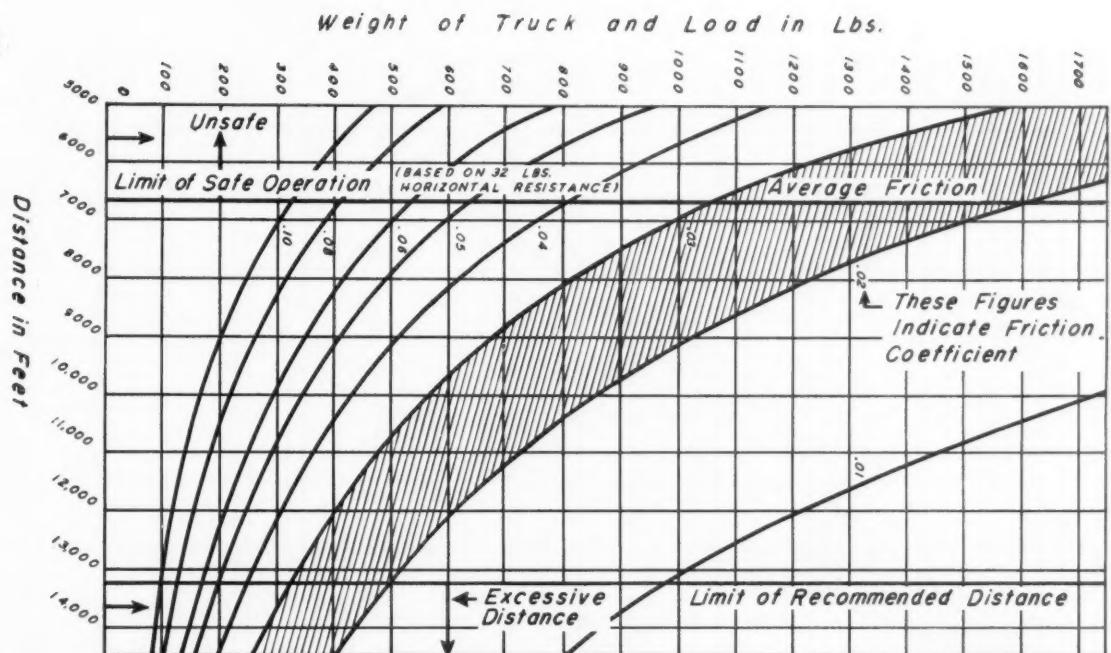
$LW$  = Weight of Load in Pounds

Knowing the weight of the truck and load, we can estimate the rolling friction coefficient.

The following table can be used to estimate the rolling floor friction coefficient when a dynamometer is not available.

Type of Pavement	Friction Coefficient (Rolling)
Concrete Floor	.010-.020
Asphalt	.010-.025
Stone Pavement	.015-.035
Wood Blocks	.015-.025
Macadam	.015-.030
Loose Sand	.100-.150
Pneumatic Rubber Tire on Smooth Pavement	.020-.030

A rolling friction coefficient of .020-.030 is a fair approximation of the average industrial floor.



**GRAPH NO. 1:** A truck of 1000 pounds (total weight—truck plus load) can be pushed 7000 feet per hour when the friction coefficient is approximately .03. A rolling friction coefficient of .04, however, reduces this distance to 5700 feet. This point of the graph, how-

ever, is in the unsafe zone, indicating that the horizontal pushing resistance exceeds the recommended 32 pounds (limit of safe operation). The second horizontal line indicates the limit of recommended maximum distance that a trucker should cover in one hour.

It is obvious that the horizontal resistance of a truck is the product of its load and friction coefficient. This emphasizes the importance of good floor conditions in trucking areas and aisles.

#### A. Calculations of the horizontal resistance of a truck in motion (Level floor with no ramps or down or up grades involved):

$$R = F(TW + LW)$$

$R$  = Horizontal Resistance in Pounds

$F$  = Floor Friction Coefficient

$TW$  = Weight of Empty Truck in Pounds

$LW$  = Weight of Load in Pounds

*Example:* What is the horizontal resistance of a truck in motion under the following circumstances?

Wood floor, average condition       $F = .02$

Weight of empty truck      = 200 lbs.

Weight of load      = 500 lbs.

$$R = .02 (200 + 500) = .02 \times 700 = 14 \text{ lbs.}$$

#### B. Calculation of the amount of human energy necessary to keep a truck in motion:

The following formula gives a good approximation of the amount of energy involved.

$$E = \frac{7D(W + 12R)}{10^5}$$

$E$  = Amount of energy in Calories

$D$  = Distance in feet that the truck is to be moved

$W$  = Weight of the trucker

$R$  = Horizontal resistance of the truck in motion

*Example:* We can calculate the amount of energy expenditure of a trucker (body weight 150 pounds), pushing a truck of 200 pounds, loaded with 500 pounds of merchandise, over a distance of 1000 feet, on a wooden floor in average condition.

The horizontal resistance under these circumstances is the same as in the previous example.

$$R = .02 \times (200 + 500) = 14 \text{ lbs.}$$

$$E = 7 \times 1000 (150 + 12 \times 14)$$

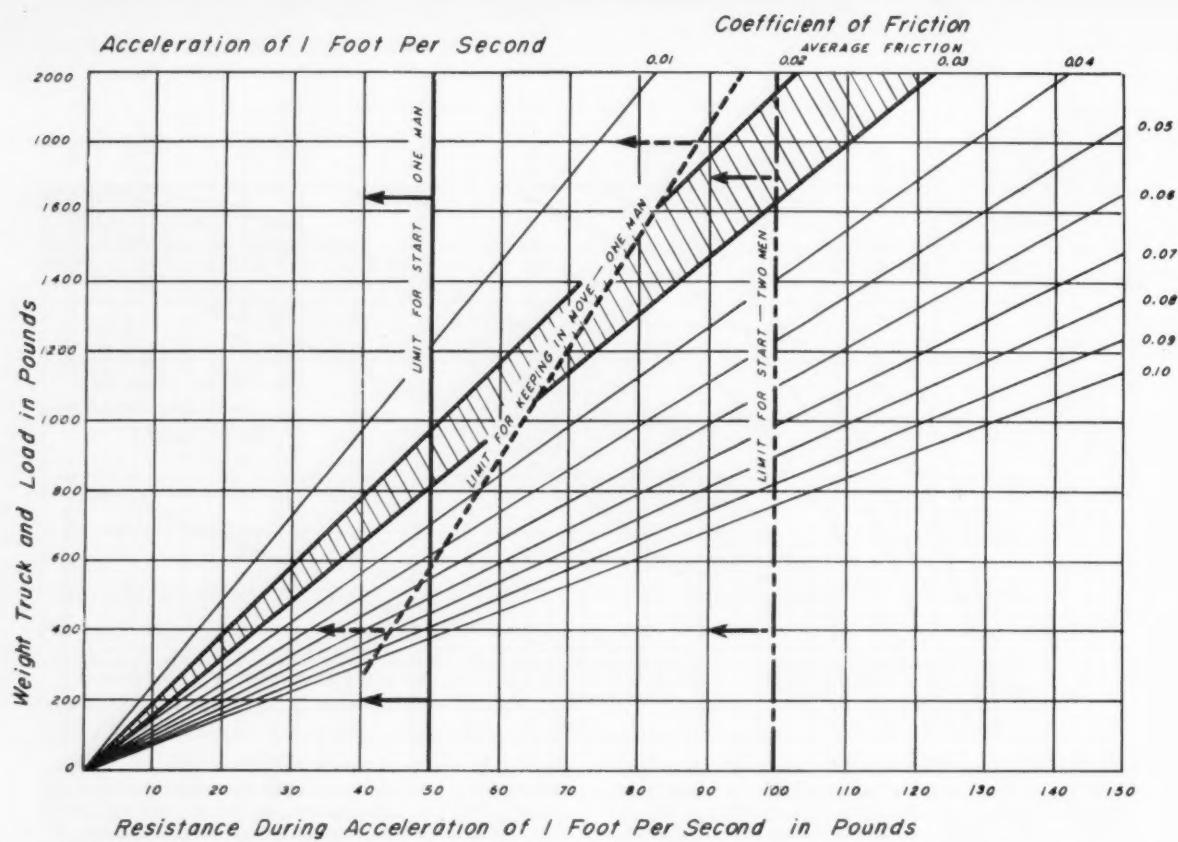
$$\begin{aligned} &= 7000 (150 + 168) \\ &\quad \frac{10^5}{10^5} = 22.26 \text{ Calories} \end{aligned}$$

To emphasize the importance of floor friction, we will repeat this calculation for a poor floor condition with a high but not unusual rolling friction coefficient of .05.

$$R = .05 (200 + 500) = 35 \text{ lbs.}$$

$$E = 7 \times 1000 (150 + 12 \times 35) = 39.96 \text{ Calories}$$

(More on next page)



**GRAPH NO. 2:** The dotted line, "Limit for keeping in motion—one man", indicates whether the total weight (truck and load) can be pushed by one man under the floor friction coefficient noted on the top.

The vertical line, "Limit for start—one man", is based on the fact that during the short period of acceleration—as in the start of movement—a horizontal resistance of 50 pounds is permissible. A truck of 1000

pounds (total—truck and load) can be safely started by one man with a floor friction coefficient of .02 or less. With a rolling friction coefficient of more than .02 but less than .07, two men would be required to start this truck in motion.

A truck of 1000 pounds (total—truck and load) needs two men to start and keep in motion if the rolling friction coefficient is over approximately .035.

Almost 80 percent more energy is consumed as a result of the poor floor condition in the second example. The maximum recommended energy expenditure per hour is approximately 200-250 Calories, and it is possible to calculate the total distance one can push a truck under any circumstances in one hour.

Graph No. 1 gives the relationship between floor friction coefficient, weight of truck plus load, and the maximum distance one should truck during one hour. These curves are derived from the above-mentioned formulae. The weight of the truck operator is assumed as 150 pounds.

It has been noted that 32 pounds is the optimal horizontal resistance, and one operator should not exceed this recommended value for continuous operation. A heavy horizontal line on the graph indicates the area of unsafe or unfavorable operation. Another heavy, horizontal line at 13,200 feet indicates the maximum distance a man should be required to walk under any conditions during one hour.

The same formula,  $E = \frac{7D(W + 12R)}{10^5}$ , is also

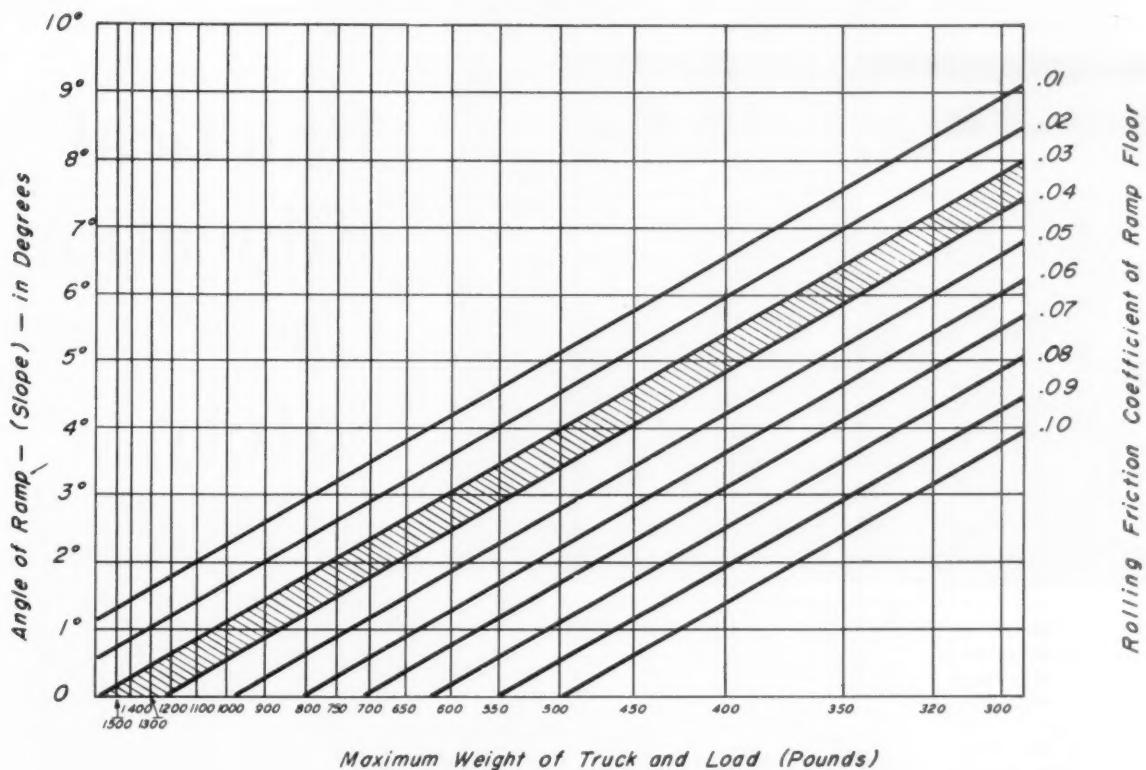
applicable for the calculation of the amount of energy involved in walking *without* a truck.

$R$  is obviously zero and the formula would be as follows:

$$E = \frac{7D \times W}{10^5} \quad (W = \text{Weight of trucker})$$

#### C. Calculation of the amount of energy involved in the acceleration of hand trucks:

The simplest way to estimate the amount of energy necessary for the acceleration of hand trucks is to add approximately 0.5 Calories for any acceleration. The amount of energy is actually dependent on factors such as the weight of the truck and the magnitude of the acceleration and must, therefore, be calculated separately in any case. Because the amount of energy expenditure for acceleration is only a fraction of the



**GRAPH NO. 3:** The weight of the truck is 150 pounds. Rolls of paper at 600 pounds must be transported on a ramp. What must the physical properties of this ramp be?

The total weight of truck and load is 750 pounds. The following combinations of angles and friction coefficients can be found in the graph.

Angle of Ramp	Floor Friction Coefficient
1°	.05
1.5°	.04
2.1°	.03
2.7°	.02
3.2°	.01

A slope of only 2 degrees will be the most practical for a one-man truck operation under the above-mentioned conditions.

total amount of energy expenditure in trucking, it is justified to use the simplified value of 0.5 Calories per one start.

#### A Typical Example

Let's assume an operation involves the moving of 30 truck loads of material per hour from the warehouse to a machine station. The distance from warehouse to machine is approximately 200 feet. The weight of the empty four-wheel truck is 150 pounds. The average load is 650 pounds. Total load and truck equals 800 pounds. The floor is not in a very good condition, and the rolling friction coefficient is estimated, therefore, at .04. The weight of the trucker is given at 150 pounds. (This is not an important factor as a 15 to 20 percent variance does not materially affect the calculations.)

The trucker is only required to push the loaded truck from the warehouse to the machine station and return an empty truck. He does not load or unload.

#### Calculations:

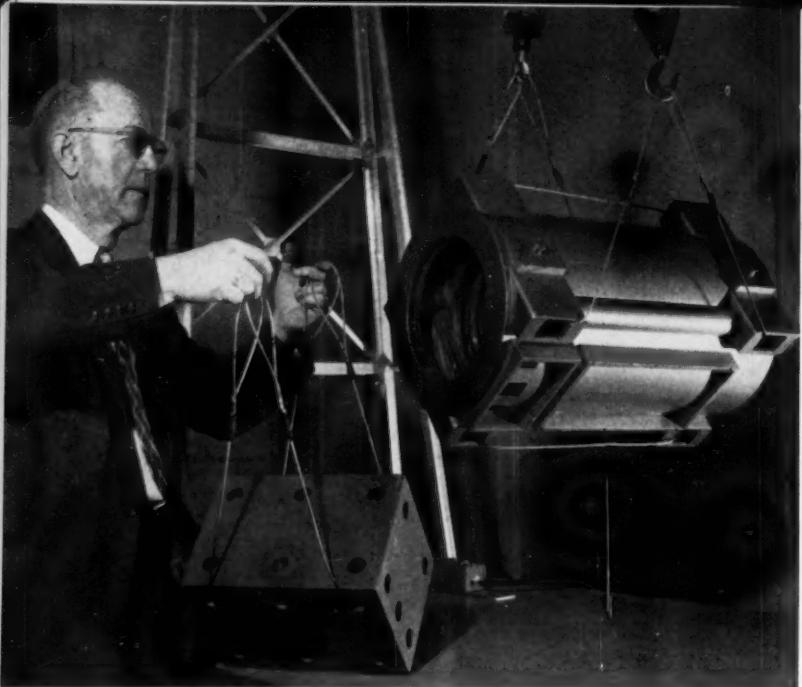
##### A. Energy involved in keeping the *loaded* truck in motion:

$$\begin{aligned}
 R &= f \times (TW + LW) \\
 &= .04 (150 + 650) = 32 \text{ pounds} \\
 E &= \frac{7 \times D(W + 12R)}{10^5} \\
 &= \frac{7 \times 30 \times 200(150 + 12 \times 32)}{10^5} = 224 \text{ calories}
 \end{aligned}$$

##### B. Energy involved in keeping the *empty* truck in motion:

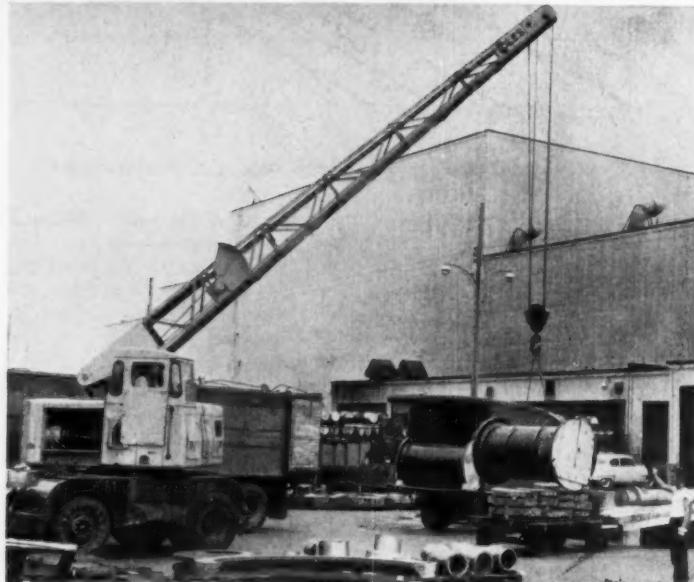
$$\begin{aligned}
 R &= f \times (TW + LW) \\
 &= .04 \times 150 = 6 \text{ pounds} \\
 E &= \frac{7 \times D(W + 12R)}{10^5} \\
 &= \frac{7 \times 30 \times 200(150 + 72)}{10^5} = 93.24 \text{ Calories}
 \end{aligned}$$

(Continued on page 123)



# Practical Education for Safety

DEMONSTRATING proper method of lifting heavy unit is Frank Sherman, material handling specialist, instructor at GE's Large Steam Turbine-Generator Crane School.

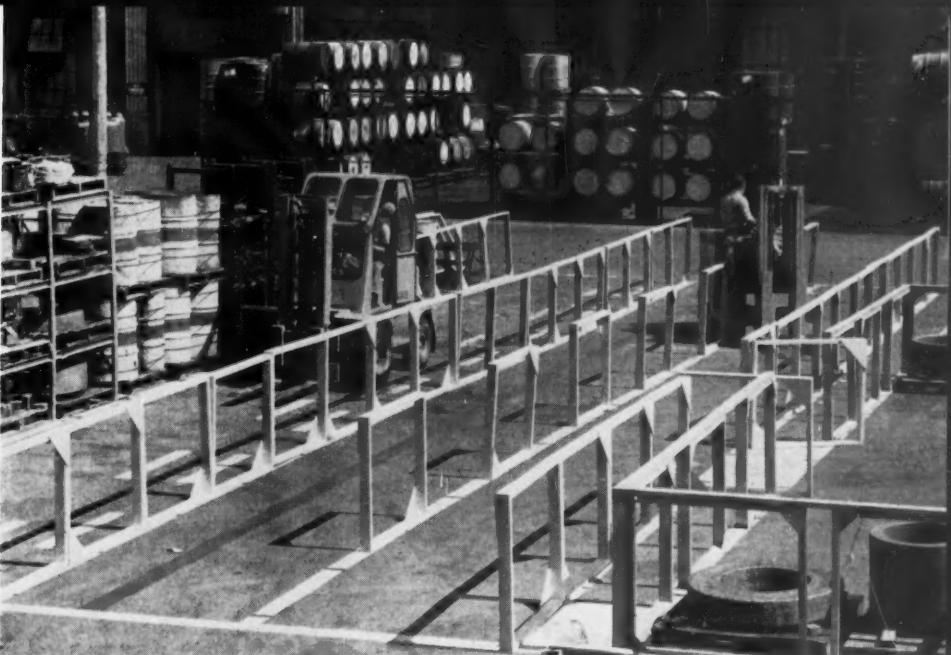


ON-THE-SITE instruction is given by material handling specialists to all personnel who will operate yard equipment, so that safe habits can be firmly implanted.



SAFETY-ENGINEERED  
HANDLING

**By Charles E. Harper,**  
**Safety Supervisor, Large**  
**Steam Turbine-Generator**  
**Dept., General Electric Co.**



**OBSTACLE COURSE**, above, part of training program for all vehicle drivers, duplicates factory problems as shown in closeup, left. Qualified drivers receive "licenses". Periodic refresher courses are given.

On-the-job training schools employing equipment actually used in plant operations, or scale models of this equipment, are proving an invaluable aid to accident prevention. Two such schools for the reduction of crane and industrial truck accidents have been organized and developed by the General Electric Company's Large Steam Turbine-Generator Department in Schenectady, N. Y.

Major emphasis in these training programs is placed on learning by participating in practical demonstrations of actual situations likely to be encountered on-the-job, rather than learning by reading an instruction book. Demonstrations are designed to show the right as well as the wrong way of doing a job. It is not enough to show a workman the proper way of doing a job. He must also be shown the wrong method as well as what will happen when this method is used. It is often this demonstration of the wrong method, especially if it is dramatically presented, that makes a lasting impression on the workman and makes him acutely aware of why a particular job should be done in a certain way. Most important of all—all safety training programs, if they are to be effective, must explain to the worker *why* such and such a method is right or wrong. The *why* explanation should not be long and involved. It should be presented in terms the worker will be able to grasp and understand.

**T**HE SUCCESS of any safety program will be in direct proportion to the extent to which it is accepted by the individual worker.

It is not enough to change the method and issue instructions that a new method must be followed. The force of long established work practices and habits may be too stringent and cause the worker to revert to his former method unless he is told to his satisfaction *why* the change is made, and is convinced that it is for his own safety and personal advantage.

A worker will do a far safer and more efficient job—whether it be operating a crane, driving a truck, or running a machine—if he:

1. Knows definitely what he has to do;
2. Has learned the correct method of doing it;
3. And, most important, knows why he should do it a certain way.

Both the Crane School and the Driver's Training Program are proving extremely valuable, not only to the LST-G Department's safety program, by reducing truck and crane accidents, but also to production through more efficient truck and crane operations, and to manufacturing economics through reduction in expenditures for personal injuries, damaged material and equipment.

*(More on next page)*



TRACTOR operators, like fork truck drivers, must take exams much like those required in state auto tests.

## PRACTICAL EDUCATION FOR SAFETY

*Continued*

Truck or crane accidents are seldom caused by mechanical failure, providing an adequate system of constant inspection and maintenance is established and enforced. Any faulty condition found must be corrected immediately and no equipment permitted to operate until repairs have been checked by qualified personnel.

Truck equipment in the LST-G plant is tested by each driver before it is operated and is periodically inspected by the maintenance section. An inspection report card is made out for each piece of equipment so that the condition of every unit is known at all times. This eliminates second-guessing about when a unit was last inspected and makes it easier to spot equipment in need of repair.

***"Analysis of material handling accidents . . . revealed that, in most cases, personal failure . . . was the principal cause."***

Cables and other auxiliary equipment used in the turbine plant are inspected similarly. Crane hooks are magnetically tested annually for incipient cracks and other possible defects. This added safety measure has proved extremely valuable.

Material handling operations in the LST-G plant are extensive. The manufacturing area, with its nine manufacturing bays and one service bay, covers more than 22 acres. Over 1,500,000 crane lifts are made each year by the plant's 54 overhead traveling cranes, which vary in capacity from 5 to 200 tons. Parts handled vary in weight from 2 to 240 tons, with over 300-ton lifts made possible by using the largest cranes in tandem in the main bay. Some of these parts must be carried as far as a quarter-of-a-mile, the length of the building. A total of 125 crane operators, 165 crane followers, 9 leaders, and 11 crane foremen are needed to handle crane operations. Seventy-six fork lift trucks and tractors are used to move smaller parts and equipment about the plant.

Analyses of material handling accidents in the plant during the past few years revealed that in most cases personal failure—improper use of equipment or unsafe methods—was the principal cause. This indication has been emphasized by the fact that regardless of constant effort to control this situation by mechanical improvements and specialized methods, the results were successful to some degree but were not consistent.

Intensive study of this problem with representatives of Management and Supervision resulted first in the development of the Crane School and later the Driver's Training Program. Both of these educational programs are designed to give all personnel responsible for materials handling operations, including supervisors, practical instruction concerning their individual duties.

The Crane School course of study was compiled and arranged by Mr. Frank Sherman, a crane specialist with over 40 years of practical experience in all phases of crane operation, and is organized to give crane followers and crane operators a practical knowledge of specific problems met in their daily operations, and the proper and safe methods of handling them.

A five-foot high working model of an overhead traveling crane was made so it could be set up in the class room and operated by electrical controls exactly like the actual cranes used in the plant. Miniature models of all turbine and generator parts were constructed. In addition, miniature cables and other auxiliary lifting equipment were secured so that every operation required in servicing the factory could be duplicated in class.

***"Courses are held twice each year during regular working hours for all three shifts."***

Lessons include construction and correct use of cables, fundamentals of lifting, correct methods for



HANDLING special loads is part of regular training.

handling turbine and generator parts, and turning large units for processing. In all subjects the student is shown both the correct and incorrect methods and taught *why* the correct method should be used.

Courses are held twice a year during regular working hours for all three shifts. Each course is divided into six one-hour class sessions, held once a week. The final fifteen minutes of each session are turned over to a question-and-answer period in which workmen play a leading role and discuss crane problems encountered on the job. This question-and-answer period is important to all industrial safety training programs, giving the workman a chance to correlate what he has learned during the lecture session with actual factory situations.

The Driver's Training Program was set up last October to insure that all drivers in the LST-G Dept. are instructed in the fundamentals of safe driving and the proper use of vehicles. It was organized by Mr. Earl Welch, material handling specialist in truck operations.

At the start of the program all drivers in the following occupation classifications—industrial battery truck operator, stockroom accumulator, material mover, man, and tractor operator—were required to take both an oral and a practical driving exam—much the same as is required for a state driver's license. An obstacle course, duplicating factory problems, was set up and all drivers, regardless of experience, unable to pass both tests were required to take a refresher course. At any time during the course they could retake the tests and qualify as drivers.

*"... safe drivers . . . are given a special badge which they are required to wear when operating vehicles . . ."*

The complete course, which is required for all new drivers, consists of 16 hours of both classroom discussion and actual driving instruction on equipment to be used on the job. First sessions cover general basic information about the mechanical operation,



SAFELY high-stacking drums in obstacle course.

control, and safe methods for handling various loads. Later classes deal with practical operation of fork lift trucks and tractors.

Before completing the course, drivers must pass two written quizzes and safely operate vehicles over the obstacle course which duplicates factory situations, including entering and leaving a simulated freight car and depositing and picking up loaded pallets from both ends of the car. After qualifying as safe drivers, workmen are given a special badge which they are required to wear when operating vehicles in the plant.

In the Driver's Training Program, as in the Crane School course, major emphasis is placed on explaining the *why* of each operation as well as demonstrating the right and wrong methods of doing various material handling jobs.

Both these industrial safety training programs have been highly successful from the start. In fact, they have so well accomplished their aim that plans are being made to extend the crane school training program to cover jib cranes and to set up a new training program for portable pneumatic grinders which can be given by foremen.

*"... improved morale . . . is probably the most important proof of the value of these training programs . . ."*

Major crane and truck accidents have greatly decreased since the Crane School and Driver's Training Program have been in operation. Greater efficiency in material handling, and worthwhile economy through fewer losses by material damage are partial results. But the improved morale of crane and truck personnel, who reflect a knowledge of their work in every operation, and demonstrate their increased safety consciousness at all times, is probably the most important proof of the value of these training programs to the plant's safety program.

Both these courses have unquestionably proven the value of practical, on-the-job education as an aid to accident prevention.



QUICK LIME handled by continuous flow conveyor system from rail discharge pit to storage—and then processing—to protect workers, cut cost in fertilizer plant. Bag handling formerly exposed workers to burns.



CARBON BLACK, received in closed hopper cars, is stored via zipper conveyor. Totally enclosed belt moves with material, eliminates dust & degradation.



SAFETY-ENGINEERED  
HANDLING

# Integrating Safety Into

for process and

ANY PROBLEM IN MATERIAL handling must be approached after a careful analysis of fundamental principles—the basic objective of which is reduction of the unit cost of production.

Requirements vary with each particular situation. In one plant, the primary need may be reduced handling cost; in another, safety; in a third, the elimination of possible contamination. In other plants, still different objectives may be the ruling ones, or a combination of the ones mentioned. This means that the overall picture must be studied for a sensible solution of the particular problem in hand. After a clear understanding of the principles, our study should take the following sequences.

1. Fact-finding phase.
2. Layout of the processing sequence.
3. Study of the various methods of handling the material and finding the best method of doing the job.

#### Basic Principles For Material Handling Analysis

1. Ton-feet to be moved determines the money to be invested in material handling equipment.
2. Movement of material in large quantities per handling operation reduces material handling cost.
3. Plant layout, revised or initially designed, may be an alternative method of reducing material handling cost.
4. Standardization of material handling equipment increases utilization and reduces costs of maintenance and management.
5. Flexible equipment is more economical when a variety of materials (in load-ton-feet) is to be moved.
6. Safety in design and operation should be incorporated in all material handling equipment.

# Handling Systems

## chemical operations

By Oonnoony Thomas Thamarappallil

4. Economic analysis of alternatives, which involves selection from a series of possibilities or replacement of existing equipment with new equipment.
5. Organizational problem.

This discussion is limited to the fact-finding sequence of the total problem in the chemical and processing industries. Emphasis is on the safety problems, which are so inherent in these industries. Our attention is focused on four areas:

1. Materials handled—physical, chemical and mechanical characteristics as well as shape, density, etc.
2. Equipment itself—for periodic or batch delivery, or for continuous flow.
3. Method of employing equipment.
4. Containers—method of receiving, in process movement and reactions, shipping, materials of construction, etc.

### Classification of Handling Equipment

In the chemical and processing industries, solids, liquids and gases have to be handled. The most important handling equipment in use include: conveyors of various types for solids and packed materials; pumps, pipes and valves for liquids and gases; and trucks of various modifications, both manual and powered, for a variety of uses. Most handling equipment available in the market may be classified into either (I) the periodic or batch types and (II) continuous flow types, as follows:

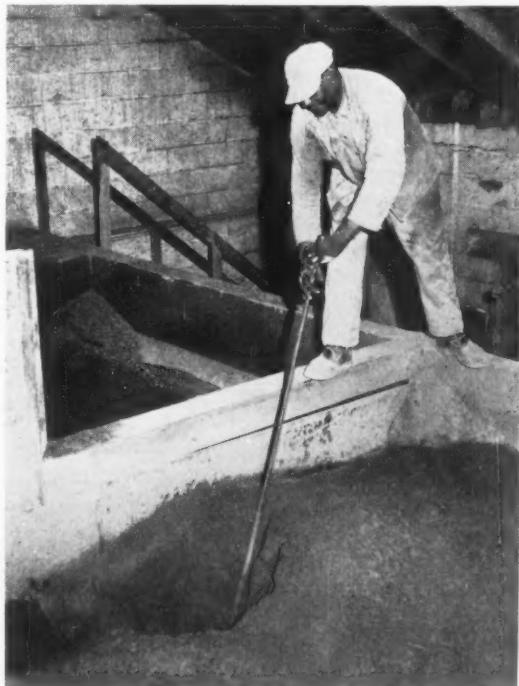
#### I Equipment for Periodic or Batch Delivery

- a. Trucks, Tractors, Trailers
- b. Rail carriers—standard, gauge, narrow gauge.
- c. Overhead carriers—cableways, monorails, etc.
- d. Lifts—hoist, telescope, etc.

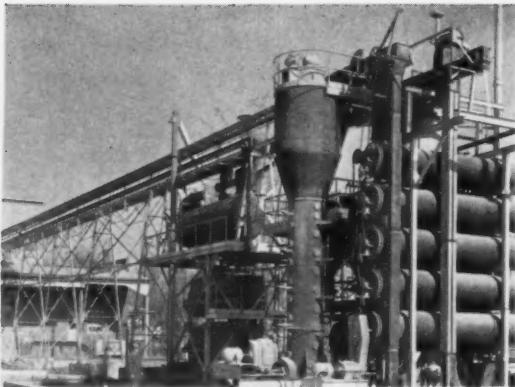
(More on next page)



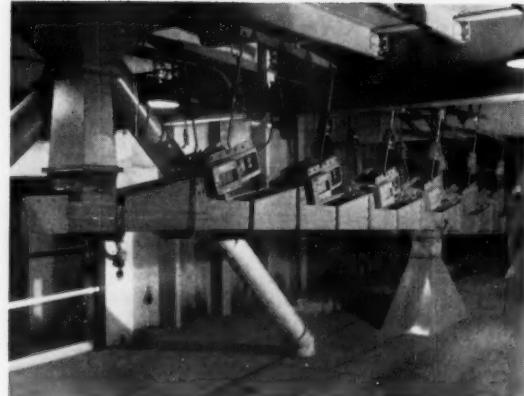
Native of Travancore, South India, Oonnoony Thomas Thamarappallil, left, has won first prize in the 1955 Clark Equipment Company Material Handling Competition, at Illinois Institute of Technology, with the paper from which this article was prepared. He is shown with Ralph G. Owens, I.I.T. Dean of Engineering. Employed by Ditto Co., Chicago, Thamarappallil is working on his Ph. D. degree in industrial engineering. He has an A.B. in chemistry from the University of Glasgow, Scotland, and an M.S. in industrial engineering from Columbia University.



DANGERS lurked when men had to break "arches" of bulk materials in bins. Now one device to do this is a rubber panel pulsated by air pumped in and out.



IN SOYBEAN SOLVENT process, continuous flow conveyors carry flakes between extraction equipment and bean and meal preparation building (left).



ESCAPE of dust and gas minimized with electrical vibrating feeders having enclosed deck and open feed ends. Power units may be spark-proof, dust-tight.

## **INTEGRATING SAFETY INTO HANDLING SYSTEMS**

*Continued*

### **II. Continuous Flow Types**

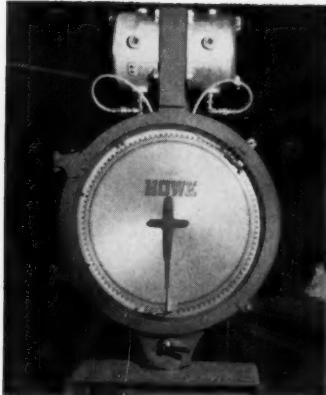
- a. Gravity conveyors—roller, pipe-line, chute
- b. Pressure tube—pressure pipe-line pneumatic tubes
- c. Mechanical—mechanical chains, power driven rollers, screw conveyors, bucket conveyors

### **Present Trends in Material Handling**

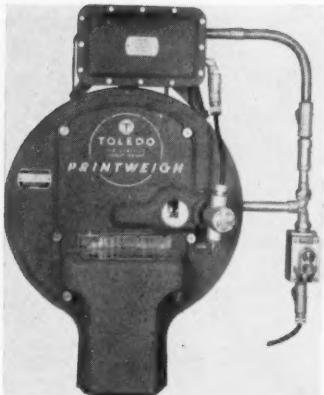
In chemical and processing industries, handling problems are very deceptive because of the wide range

corrosion, abrasion, formation of static electricity, leakage and contamination. We might also be faced with dusts, fumes and mists and the consequent fires and explosions, as well as noxious gases, vapors and radio-active hazards necessitating special service requirements to avoid poisoning.

Resistance of the materials of construction to hazards on temperature, pressure, concentration, contact with atmosphere, conditions of atmosphere in a particular region, purity of raw-materials, used, etc. For most economic operations continuous production as



**AUTOMATIC** weight control with 2 cut-off points for use in Class I, Gr. D or Class 2, Gr. G areas.



**EXPLOSION-PROOF** printing scale designed for use in atmospheres laden with dust or fumes.



**MONITORING**, controlling pipeline flow with SR-4 cell eliminates hazards of long pressure lines.

sistent with economy in operations and major objectives. Thus, in arriving at the correct speed of conveyors needed for processing purposes and the positioning of the operators with respect to the work carried out, the above principle is utilized to obtain a smooth and economic operation. In most cases, we try to fit the handling equipment into the process flow sheet.

Another trend in chemical engineering practice is, whenever possible, not only to use conveyorized process equipment but also to fit in equipment employed for interstage transport, or to permit a stage in the proc-

materials, panel boards for remote control batch weighing and automatically proportioning ingredients for dry concrete mixes are other developments.

In another phase of development, standard equipment is being fitted with up-to-date instrumentation for a number of applications.

#### **Hazards in Material Handling**

Under the previously listed four areas where safety is of utmost importance in handling operations are the following classifications of general hazards:

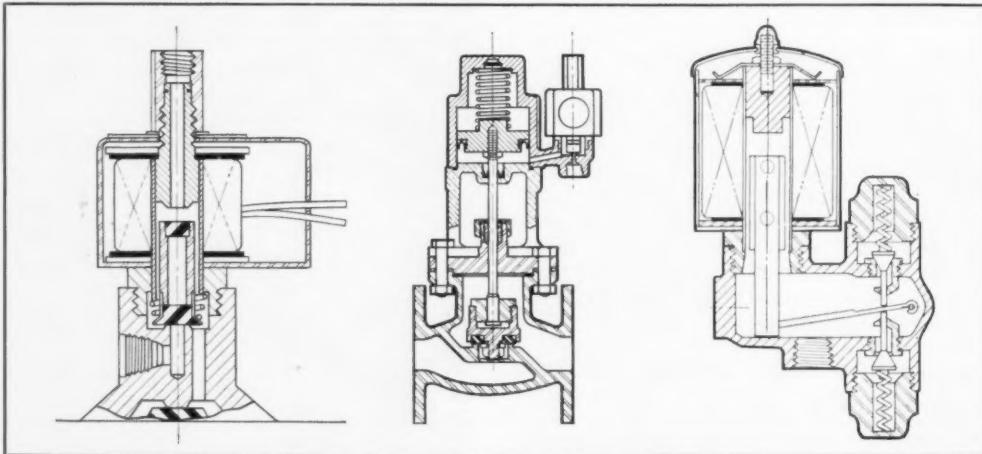
1. Corrosion, abrasion and leakage of the equip-

rollers, screw conveyors, bucket conveyors

## Present Trends in Material Handling

In chemical and processing industries, handling problems are very deceptive because of the wide range of physical and chemical properties of the materials encountered. Many times, materials are fragile, corrosive, abrasive, sticky and hygroscopic. Special materials of construction will be needed for containers and equipment because of the special hazards—involving

Resistance of the materials of construction to hazards on temperature, pressure, concentration, contact with atmosphere, conditions of atmosphere in a particular region, purity of raw-materials, used, etc. For most economic operations, continuous production, as far as practicable, is the aim in any processing type of plant. But because of the difficulties faced in synchronizing succeeding operations—and even steps in a single operation—we aim at a balance that permits the fullest use of material handling methods, con-



FLOW of highly corrosive gases and liquids can be controlled with explosion-proof valves. Unit left is especially for shut-off of fluids with suspended solids.

Center, cylinder-operated, pilot-controlled valve closes on loss of auxiliary pressure. Right, three-way valve directs flow from common inlet into one of two outlets.

sheet.

Another trend in chemical engineering practice is, whenever possible, not only to use conveyorized process equipment but also to fit in equipment employed for interstage transport, or to permit a stage in the process to be carried out on the interstage handling equipment, either when it is stationary or in motion. This trend is illustrated by the two truck-tray type dryer—with trays made of vitreous enamel, stainless steel or monel metal according to specific needs—used in the color industry. The wheeled stillage trucks not only convey the tiered trays of chemicals to and from the dryer but are also used as a shelved unit for holding the trays while the batch drying is being carried out. There are plants where the process would not be possible, if it were not for the handling equipment employed. Examples are the steel band conveyors used in heat exchange problems as in cooling soap powders and grease, and for the cooling and solidification of gelatine, pitch, sulphur, synthetic resin, metasilicate of soda, wax, etc. This principle can be applied for adding heat into solids and evaporation of moisture.

### Future Potentials of Material Handling

Chemical and processing industries are reaching a stage of automation with the full integration of material handling equipment with production facilities. Development of powered conveyors of various types, powered and free conveyors, and special handling devices like transfer machines (including mechanical arms and pusher bars) are definite signs of such a stage. Rotary feeders for handling sticky and slushy

### Hazards in Material Handling

Under the previously listed four areas where safety is of utmost importance in handling operations are the following classifications of general hazards:

1. Corrosion, abrasion and leakage of the equipment employed, or contamination and degradation of materials carried.
2. Dust fumes and mist formed as result of the materials handled or the method of operation of handling equipment and processing units, and the consequent fire, heat damage, static electricity, explosions.
3. Involvement in handling operation of industrial gases and vapors which are flammable and poisonous, radiological hazards, etc.
4. Other, miscellaneous problems in the handling of sticky, hygroscopic and fragile materials, which problems result in the lowering of worker morale in addition to wastage and inefficiency in operations.

#### **Corrosion, Abrasion and Allied Problems:**

Corrosion, abrasion and the consequent leakage, contamination and degradation of the materials handled are especially costly in chemical industries—where pipelines, tanks, pumps, tankcars, tankwagons, etc., are used for liquid and gaseous substances, both external and underground.

#### **Preventive Measures:**

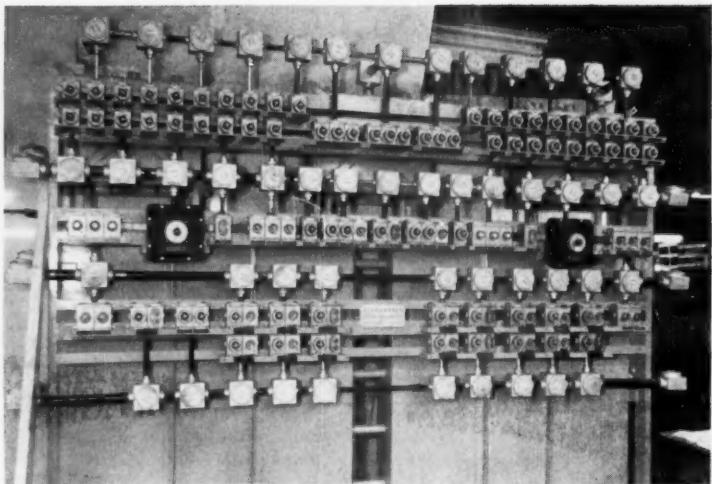
- a. Selection of the cheapest type of equipment available.
- b. Use of high-first-cost corrosion-resistant metal

*(More on next page)*

## INTEGRATING SAFETY INTO HANDLING SYSTEMS

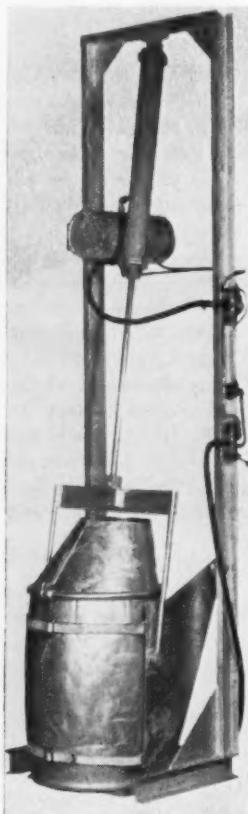
*Continued*

**EXPLOSION-PROOF** panel for dust laden air controls automatic scales in blending ingredients for nationally known self-rising flour. Another method would be to enclose conventional panel in separate room.



or alloy in the best type of handling equipment.

- c. Use of containers that will protect the equipment adequately.
- d. Protective devices for conditions like galvanic corrosion, and proper planning for routine replacement and reconditioning of handling equipment.



**NITROCELLULOSE** in stainless steel drum is safely dumped by explosion-proof equipment operated by air-hydraulic circuit for accurate speed control.

A careful selection from a wide variety of materials of construction—both metallic and non-metallic—and methods of operation are to be made to suit the manifold needs of the chemical industry. A few comments on this are relevant here.

Malleable iron, especially with copper content, has better resistance to corrosion than steel, and if hot dipped or plated with cadmium or zinc, the resistance to mild corrosives is vastly improved. Note, however, that these platings when dissolved have a toxic action and so cannot be used when food products may contact them. Also, the platings wear off in time.

Manganese bronze has good resistance to corrosion from nearly all fruit and organic acids but is vulnerable to nitric acid. Chains of stainless steel with molybdenum or copper content are nicely resistant to fruit and all organic acids, but they are extremely expensive. In general, the simple chains such as the detachable-link belting and the forged rivetless type are best where corrosive action is expected. Best chains for different purposes are to be determined, however, after consultation with responsible manufacturers.

Along with corrosion and abrasion in chains, but quite distinct from it, there is another factor which may cause trouble in heavy duty conveyors and elevators. Under heavy pressure at the drive sprockets, actual seizure occurs between the links and the sprocket. This is commonly called *galling*. Possibly this a molecular seizure of metals of the same or similar composition when contacting surfaces are absolutely clean and in direct, intimate contact under pressure. A lubricant prevents this, and it may or may not prevent abrasion.

The most common preventive measure for steel structure at ordinary temperature and exposure to atmosphere is to cover the surface with paint or other coatings like sprayed aluminum—depending on the conditions of exposure, the rough handling to which they are subjected, etc. The most desirable scheme is to be devised, for each particular situation, by a com-

*(Continued on page 136)*



HAZARDS in handling heavy, unwieldy materials have been vastly reduced by mechanical equipment as . . .

## Utility Stresses Safe Yard Storage

**I**NCREASING mechanization has, for some time, been an established trend in material handling operations of utilities. This has been encouraged and sponsored by the American Gas Association, a recent winner of the National Safety Council's *Association Award*.

Member companies employ fork trucks, transporters, stackers, conveyors, hoists, cranes, slings, racks—about every kind of mechanical aid to reduce accident potential and increase operational efficiency.

Typical of good member operations is that at the Oklahoma Natural Gas Company, in Tulsa. Roy L. Groves, assistant manager of purchasing, believes that, with his mechanical equipment, and by handling unit loads, a great many injuries—such as mashed fingers and toes, hernia, and strained backs—are prevented. The mobile crane, he says, "has been of greater benefit from a safety standpoint than any other piece of material handling equipment—by its use in handling pipe, valves, scrubbers and other large, bulky and unwieldy materials."

In this he is supported by J. A. Lauderdale, who, as stores supervisor, also has been responsible for the development and utilization of better—and safer—material handling methods and equipment. These men fully realize that the handling equipment they have is only as safe as the operators, supervisors, and their training make it.

Storage of all material in stock—and in numerous instances the storage of materials removed from con-

struction or purchased for construction—is under the supervision of the Purchasing and Stores Department. Approved methods of storing materials are handed down to the supervisor, foremen and laborers actually involved in this process. Standards of pipe stacking have been adopted. Heights to which materials can be stored are limited. Aisles and roadway clearance specifications have been established. Traffic lines have been painted on the floors of the storeroom and on the surface of the pipe yard for the safe operation of mechanized handling equipment.

Supervisors of the yards and operators of handling equipment must observe rigid rules in the operation of their machines. They have specified inspection times to check their equipment for faulty cables, brakes and the like. Maintenance of proper guards on equipment in the yard, storerooms, and shops is a responsibility of the purchasing and stores personnel.

Regularly scheduled safety meetings are held at the plant's two general storerooms. Subjects discussed are those which have been suggested or recommended by the Safety Department, the General Purchasing and Stores Department, or selected by storeroom personnel. If there has been an accident since the last meeting, this will be one of the subjects for discussion. The hope is that the whole group's thinking can be concentrated upon the cause and measures necessary to prevent reoccurrence. All storeroom and yard employees are encouraged to submit ideas for better handling and safety. *Photos courtesy Ruth Canaday.*



IN DISASTER, mobile radio makes it possible to direct all emergency work from a single point, avoid confusion, use men and equipment to best advantage.

## Two-Way Radio Serves Safety Three Ways

By Harold A. Jones



SAFETY-ENGINEERED HANDLING

**C**OMPLETE control of material handling operations is being achieved today through radio systems operating at many plants. And, quite logically, these systems are often integrated into companies' overall safety programs. It is not uncommon to find an entire disaster plan built around 2-way, mobile, industrial radio.

Such was the case at the Whiting refinery of Standard Oil Company of Indiana. The firm's radio system, consisting of 36 units, had been installed some four years before the early morning explosion and fire of last August 27.

Because the radio system had been integrated into the plant's disaster plan, the blaze was confined to a very small portion of the refinery. Since all other com-

munications were blown or burned out, radio prevented damage which, quite conceivably, could have been many times greater.

There are at least three ways in which radio can provide distinct safety benefits in the plant.

One is in reporting instantly the occurrence of a serious accident to a worker or other crises—such as escaping gas or chemicals, fire, or similar hazards. Since material handling and other vehicles constantly travel the plant areas, there is always a radio-equipped unit near the emergency scene to call for help. Perhaps only a minute is saved, but even such a short interval can often prevent disastrous loss—or save a life.

Directing emergency operations is another important safety function for mobile radio. The emergency



CONFINEMENT of fire to small area was aided considerably by industrial radio system operating at

Whiting refinery when disaster struck. Sand trucks were directed to zones where flooding oil required diking.



EMERGENCY vehicle of plant equipped with two-way radio so help for injured is never more than sec-

onds away. Plant-wide integration of radio provides maximum support for emergency and fire vehicles.

director or fire marshal can reach the entire crew instantly, and utilize all his men and equipment to best advantage. Not long ago a small fire started at the Chicago warehouse and shipping center of Johnson & Johnson. This company, one of the pioneers in modern handling techniques, has 2-way radio on nine of its fork trucks—all of which responded within seconds.

With one of the mobile units acting as the control point for fire-fighting direction, the remaining vehicles moved away tons of stock which otherwise would have been damaged. The quick action made what otherwise might have been a serious loss a small and almost forgotten accident.

There are still, unfortunately, occasions when workers are seriously injured and require immediate medical attention. A nearby radio-equipped vehicle can always be counted on to "get through" to the dispatcher instantly. A key man in the plant safety program, he knows how to get assistance without faltering.

A third contribution of mobile radio to plant safety is in what might be termed "environmental control" when an emergency situation develops. Any fireman, policeman or ambulance driver can tell you he often has to fight a milling crowd of bystanders as much as those he encounters in the emergency itself. And plant personnel, after all, have as much curiosity as the man in the street.

More importantly, when an extreme hazard forces the rapid mass evacuation of personnel from a large building, strategically spotted units of a mobile radio system can work with unmatched effectiveness in avoiding dangerous crowding and panic—letting each other know through which exits to guide the evacuated personnel. Any plant safety program worth its salt provides for the rapid and orderly clearance of workers from the premises.

What are some of the important things to do in putting two-way radio to work in your own plant safety program?

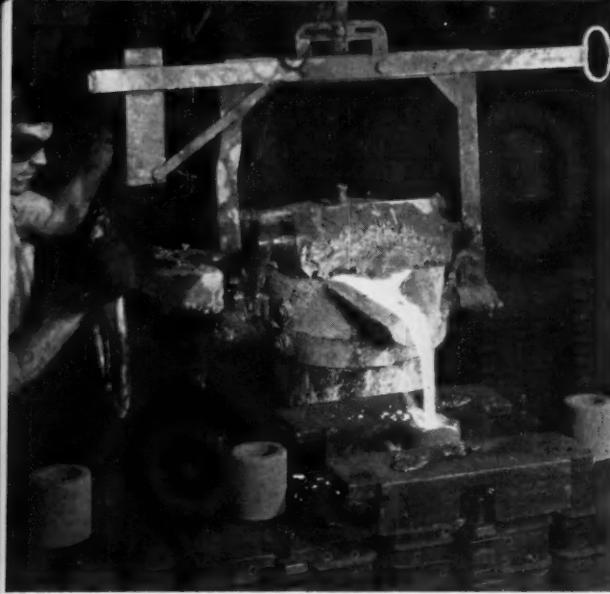
It would be well, first, to examine the disaster and emergency possibilities—fire, flood, earthquake, process explosion, structural collapse, tornado, and of course, personal injury to an individual. Determine exactly what communications problems each emergency poses. Assume that the disaster will partially or completely knock out wired plant intercommunications systems. Then, for each type of emergency, you are in a position to decide where your mobile radio units should be stationed and exactly which essential duties each should perform.

Second, formalize your use of radio by snappy group meetings to educate the operators of mobile radio vehicles in their roles as emergency personnel; conduct simulated emergency drills periodically.

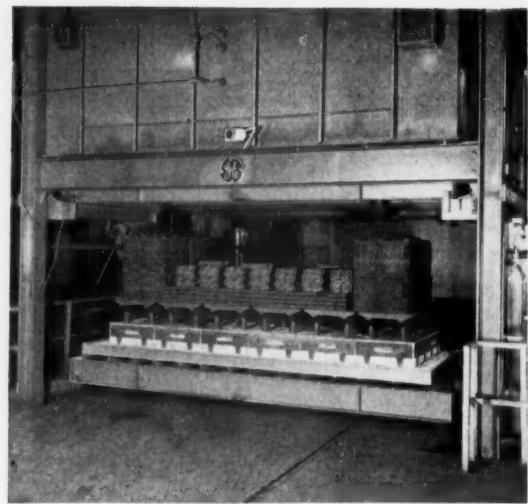
Third, give extensive intra-plant publicity to the safety facilities which are available through the central radio dispatcher—so that any key employee can summon help immediately when needed.

Finally, and of paramount importance, make absolutely sure that everyone in your plant connected with your emergency plan is, himself, thoroughly familiar with the simple operation of the radio units. Ascertain that each is fully aware that radio is always available as vital communications help when any kind of emergency occurs.

*Mr. Jones is manager of the Technical Information Center, Motorola Communications and Electronics Inc.*



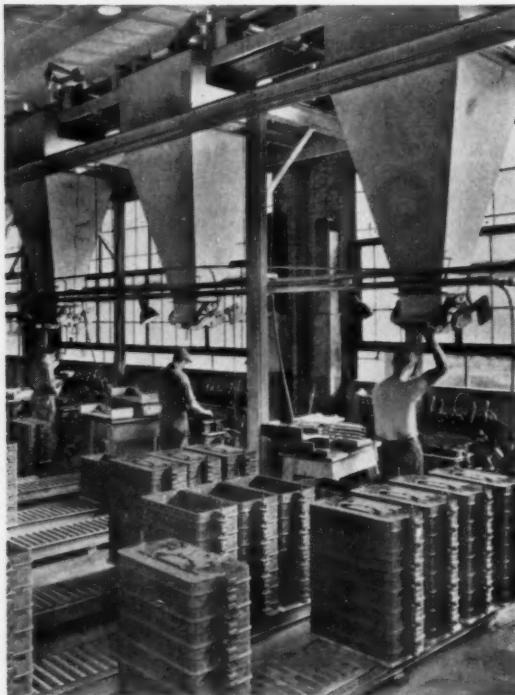
CLOSE CONTROL AND SAFETY in pouring are provided in the modern foundry by mechanized ladles held by hoists which travel on conveyors or monorails.



MECHANIZED annealing oven in which container loads of castings are automatically elevated into oven, baked and removed at pre-determined time cycles.



SAFETY-ENGINEERED  
HANDLING



DISAPPEARING is the need to shovel sand into molds. Hoppers, loaded by overhead conveyors, take over this fatiguing job as molds roll by on conveyors.

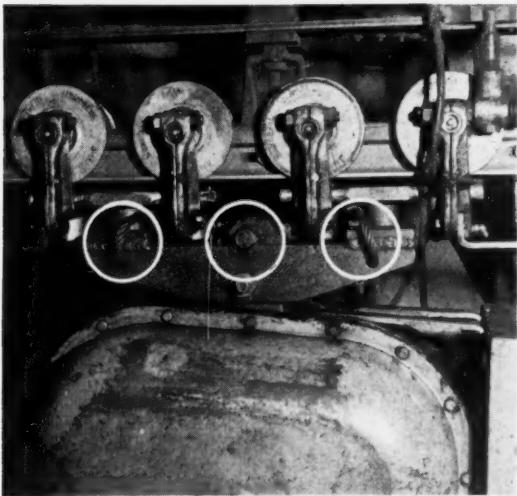
## Foundries Grow as mechanized

**I**NVOLVING the handling of molten metal, the casting process has been among the more hazardous operations, according to statistics from the National Safety Council. Accident experience of 1954 showed foundries to be 26th among 40 industries.

Handling metal at about 3000 degrees F. creates many problems. The heat of the metal, particularly during warm weather, is an additional fatigue factor which cannot be accurately reflected in injury statistics. Spillage and similar conditions provide exposure to the hazard of burns. Grinding, chipping and other operations expose eyes to injury.

Even with all of these obvious hazards, the experience among member companies of the Malleable Founders' Society indicates that more than half of the lost-time injuries are the result of the handling of material in the foundry operations and are not connected with the obvious hazards. In a recent survey, 330 injuries out of a total of 523 were the result of bad material handling.

Technological advances in the foundry industry have been very rapid in the past twenty years. The substitution of mechanical effort for human effort in material handling has been one of the most significant improvements. Monorail and conveyor systems for handling molten metal eliminate the need for carrying



GUARDS against human failure provided at three points on hoist after overloading caused break, dropping ladle of iron, which ultimately led to small fire.



MINIMUM EFFORT required as conveyorized ladle is loaded at furnace for delivery, without manual lifting, to molds. Reduced fatigue sharpens worker attention.

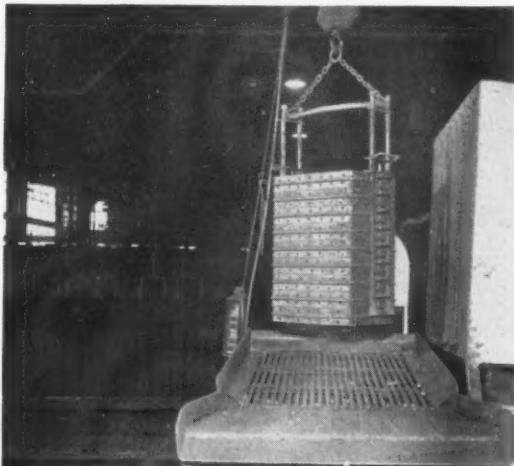
## Safer, Cleaner handling increases

hand ladles long distances from the furnace to the molding floor. The installation of bins and other work areas at normal handling level has reduced the necessity for picking up materials on which work is to be performed.

Complete mechanization of the entire foundry process is possible. This involves a large expenditure of money for mechanical equipment. It may not be practical for the jobbing shop, manufacturing relatively small quantities of each part to the customers' specifications. But total mechanization is not necessary to make a vast improvement in the mechanical handling in the small shop.

The use of front-end loaders and overhead hoppers has been found highly practical in the elimination of the need for shoveling the great volume of sand required to form the molds into which the molten metal is poured. This eliminates the exposure to strain from shoveling itself, and also reduces fatigue which increases the susceptibility to injury. Mechanical weight shifting has done much to reduce back strains, which were so common a short time ago. Fork lift trucks transport materials from one process to another and automatically position them at an easy-to-reach-level when needed. The automatic dumping and shake-out

(Continued on page 122)



AUTOMATIC shake-out where castings arrive at table height. Excess metal is then removed and castings put in transport boxes for delivery to next process.

Information provided by the Malleable Founder's Society, which has just received a National Safety Council Association Award as a result of a long-range safety service and educational program for its members.



SAFETY-ENGINEERED  
HANDLING

The work is hot, heavy and exacting, but kept clean and safe by good handling.

## 2 Million Man-Hours Without A



RACK-TRUCKS bring stacks of staves to jointers to be formed three-eighths inch wider in center to form bilge. Most dust and litter is removed by exhaust.



HELD by "forming hoops" barrel is "raised" with 28 staves. In this shape, it goes through conveyorized steam chamber and drying oven or "firing ring".

PRACTICAL and proved ideas for safe material handling abound in an operation inherently dangerous. It is the production of barrels for the maturing and storage of the fine bourbon whiskies produced by Brown-Forman Distillers Corporation, in Louisville, Ky.

As a result of the application of ingenious, plant-engineered handling devices—as well as the full utilization of commercially available equipment—the company's Blue Grass Cooperage is approaching a record of two million man-hours without a lost-time accident.

All of the dangers common to woodworking are present in the cooperage, and there are a number of uncommon ones—fire and heat, objects put under tension and pressure, heavy equipment to move, awkward and bulky products to lift and transport, to name a few.

From the beginning of the business of making bar-



WINCH arrangement pulls open ends together so that forming-hoops can shape barrel. Hoops, in background, automatically supplied by overhead channel.

as the Blue Grass Cooperage approaches . . .

## Lost Time Accident

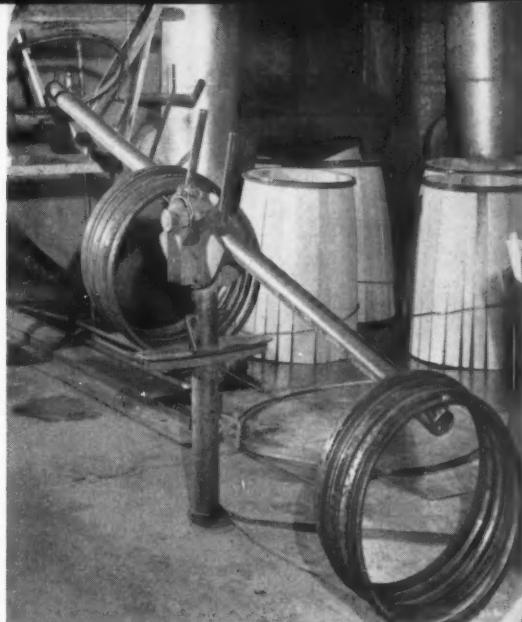
rels, as much work as possible is taken out of the hands and off the backs of people. The staves of choice, carefully dried white oak—cut to 35-inch lengths—are brought from storage to the jointers stacked on large-wheel platform trucks. The barrel is then “raised” as ends of 28 staves (average) are inserted in a fixed base and held by heavy steel rings (called forming-hoops) at about the positions of the ultimate steel-strap hoops on one end.

After the assembly has gone through a conveyorized steam chamber and “firing wheel (oven),” the barrel shape is completed. Steel cable operated by a horizontal winch arrangement pulls the ends of staves together so that two more forming-hoops can be slipped on. The only manual effort required here is the proper positioning of the cable and dropping the rings on the barrel; the heavy work—formerly a tough job for strong men—is done by the winch.

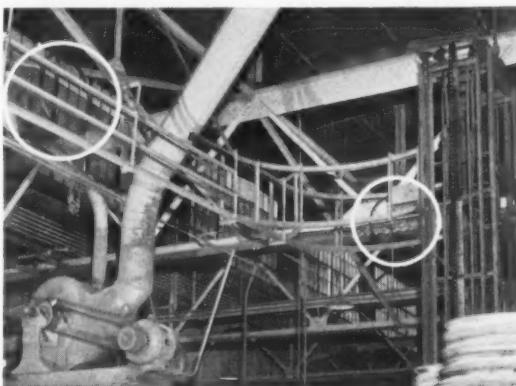
(More on next page)



ROTATING device automatically lifts charred barrels onto parallel rails leading to “crozier.” Charring is conveyorized, automatic, electrically timed.

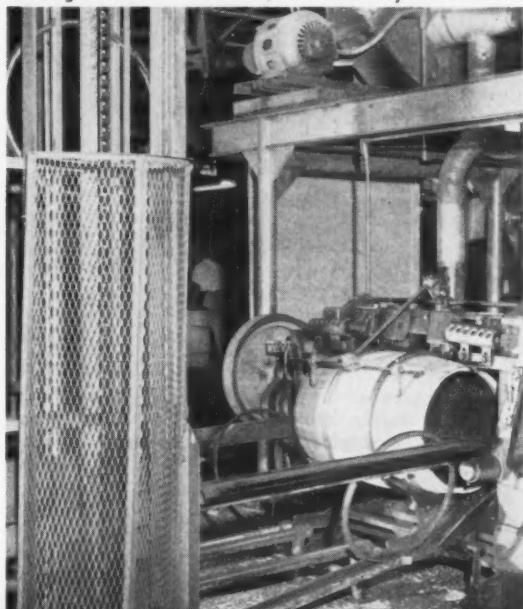


ACCUMULATING at raising station, hoops slide down channel and onto spindle. Operator releases them, as required, by unlocking and rotating the handles.



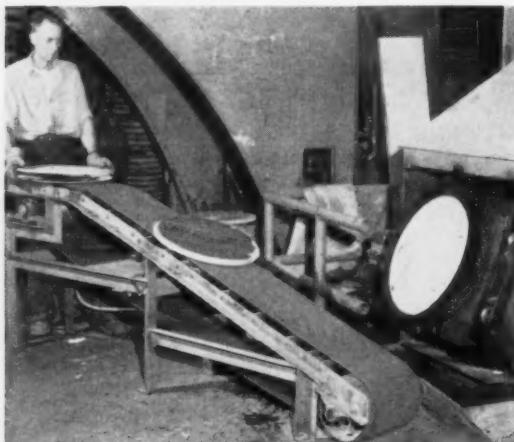
ROLLING in overhead channels, forming-hoops (circled) require no handling, are kept off floor, as they move by gravity to automatic gate for redistribution.

MECHANICALLY removed at crozier, hoops start travel back to barrel raising stations via channels leading to chain elevator, shielded by wire mesh.





CHAIN CONVEYOR automatically lifts barrels to parallel rails on which they roll to station where last two forming-hoops are mechanically removed.



FLOPPED out of conveyorized head-charrer, barrel heads land on belt conveyor from which they are removed in pairs and stacked char-side to char-side.



STEAM evacuated suction cup helps in "head-up" operation as worker inserts barrel ends, sets first permanent hoops. Helper keeps heads smooth-side-up.

## 2 Million Man-Hours Without a

Next comes the charring operation—basic and carefully controlled for the manufacture of good bourbon. This is largely mechanized, electrically controlled. The operator merely places the barrel on a conveyor drag-cart, pushes a switch button, and the cart moves through a pit, over a gas fire for the time required by the texture of the wood. As the barrel is carried out of the firing pit, a valve automatically releases a water spray that puts out the fire. The operator tips the hot barrel on its side and rolls it a few feet to a mechanical lifter which raises it to guide rails—on which it rolls to the "crozier" and a "de-hooper". The crozier automatically cuts a chime in each end. Then mechanical fingers pull the outer forming-hoops off. These roll in channels down a slight incline and are picked up by hooks on a chain elevator. There's a chain on each side of the elevator frame, and hooks are spaced so that hoops are raised in staggered sequence. At the top, hoops feed into overhead channels down which they roll to a gate that automatically sends them to four locations—for reuse as other barrels are raised. This entire process operates continuously and automatically.

### Flopped by Foot Control

After the crozier, barrels go to the "head-up" machine, where previously charred heads are put on. Handling in this operation is greatly aided by a suction cup, operated by a steam-jet evacuator system, which picks up and places the heads. The operator has merely to hold the cup and center the end. The permanent hoops of steel-strap are simultaneously set on ends of barrels to hold the heads.

Here, even the work of turning the barrel end-for-end is mechanized. A side-gripping device, working off-center on the bilge, flops the barrel by foot-pedal operation.

Heads come to this station from the automatic head charrer designed by Brown-Forman engineers. This consists, essentially, of a slat conveyor that takes the planed and beveled heads over gas flames at adjustable and automatically held rates. As heads emerge from the burner, they are automatically flopped onto an inclined belt conveyor for accumulation, stacking and delivery to the head-up machine. As they are stacked char-side to char-side, a helper at the machine turns heads as required.

From the head-up operation, barrels roll down floor-level rails until they are automatically lifted to rails elevated a few feet above the floor. The "elevator" is a continuously operating chain conveyor, running from a pit to the raised rails. A cradle held between two chains lifts each barrel without any attention from an operator. At the end of the rails, the center form-

## Lost-Time Accident

*Continued*

ing-hoops are automatically pulled off, fall into a pit, and are picked up by another chain elevator—like that at the crozier—for recirculation through the overhead channel system. Permanent hoops are then slipped on but not driven down. Following a 24-hour storage period, the hoops are finally driven on by machine—and here, again, the barrel turning device is employed so that the hoop machine can drive from each end.

When the barrel has been tested by water and air pressure—and found leak-proof—it is placed on a floor-level, double-chain conveyor for transport to parallel rails leading to the storage accumulating area.

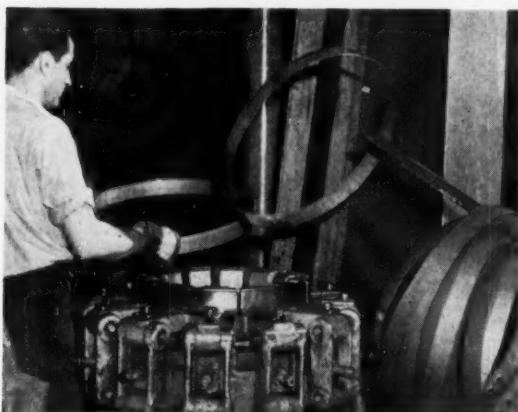
### Hoops Fly Through The Air

Another operation has been mechanized to save muscles, prevent accidents, and boost production.

The cooperage makes its own riveted barrel hoops. Formerly these had to be removed from the forming machine by hand. There were usually loose hoops around and, therefore, some danger. Besides, the job was slow. Then company engineers devised a "kicker", which automatically flips finished hoops through the air, as they are completed, so that they land on an inclined spindle for accumulation. This has eliminated clutter and provided three-times greater production.

### Clean Housekeeping A Safety Essential

Brown-Forman believes that a clean house is a safe house. And that a safe house means good efficiency. Every operation is well guarded. Scrap and rubble are kept out of workers' way. Safety Director Joe Redelberger believes that good housekeeping will eliminate more than 95 percent of all plant accidents.



FLIPPED once in the air, completed hoops accumulate on spindle next to forming machine as operator positions next strip. "Kicker" boosted efficiency 300%.



COMING OFF barrels, forming-hoops slide into pit and are picked up by hooks on chain elevator feeding overhead channel system. Permanent hoops now go on.



BARREL-TURNER operating at hoop driving machine. This operation, requiring no more effort than the depressing of a foot pedal, conserves much energy.



FLOOR CONVEYOR carries finished products—bored and tested from production line to accumulation area and ultimate transport to storage.

# CONVEYORS

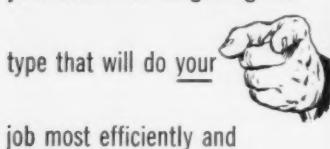
Buschman designs



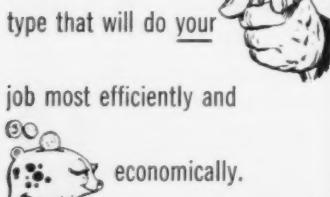
and manufactures a complete



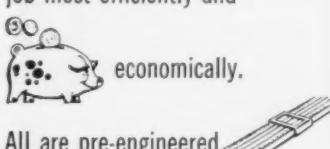
line of conveyors...



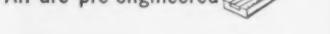
your assurance of getting the



type that will do your



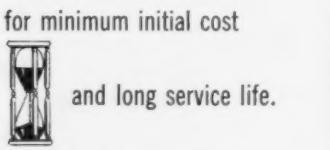
job most efficiently and



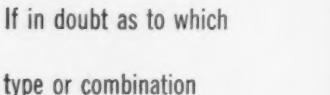
economically.



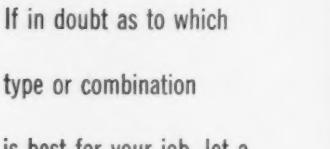
All are pre-engineered



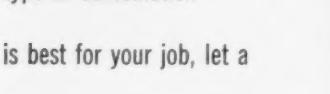
for minimum initial cost



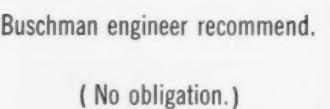
and long service life.



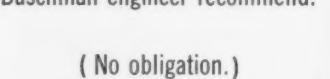
If in doubt as to which



type or combination

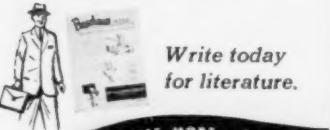


is best for your job, let a



Buschman engineer recommend.

( No obligation.)



C-228-EWB

Write today  
for literature.



THE E. W. BUSCHMAN COMPANY  
4450 Clifton Ave. • Cincinnati 32, Ohio

REPRESENTATIVES IN PRINCIPAL CITIES

Circle No. 26 on Reader Service Card  
92

## M.H.I. CLINIC IN CLEVELAND AND LOUISVILLE

The traveling clinic of the Material Handling Institute was in Cleveland, Ohio, and Louisville, Ky., during October. In Cleveland, where approximately 100 attended, joint sponsors were the American Material Handling Society and the Society for the Advancement of Management. In Louisville, with attendance about 200, sponsor was the Falls City Chapter of AMHS.



Illustrations show the working groups in Cleveland. In the above picture are: George Adams, The Raymond Corp.; Paul R. Hatcher, Richards-Wilcox Mfg. Co.; Glen Johnson, Jr., Clark Equipment Co.; Lee C. Daniels, Allis Chalmers Mfg. Co., Buda Division; and F. C. Wier (Moderator).



Above are C. L. Fell, The American Mono-Rail Co.; William D. Black, Automatic Transportation Co.; J. E. Carle (Moderator); J. C. Streb, The Union Metal Mfg. Co.; John Rumsey, Jervis B. Webb Co.; and E. W. Franz, May-Fran Engineering, Inc.



Here are W. B. McClelland (Moderator); R. L. Fairbank, Towmotor Corp.; R. B. McCurdy, The Lauden Machine Co.; G. B. Davis, Baker-Raulang Co.; Gayle Heslet, Acme Steel Products Div., Acme Steel Co.; and Thomas L. Griffith, Pittsburgh Steel Products Co.



In this group are T. H. Round, David Round & Son; T. L. Goldsmith (Moderator); H. T. Saver, Exide Industrial Div., The Electric Storage Battery Co.; J. G. Frishkorn, The Euclid Crane & Hoist Co.; and S. W. Gibb, C&D Batteries, Inc.



Above panel comprises Alfred Huntington, Cleveland Crane and Engineering Co.; George Greenberger, Sage Equipment Co.; Paul Bauder, Lewis-Shepard Products Inc.; M. A. Fischlin (Moderator); A. C. Timmons, Lift Trucks, Inc.; and Joseph Murray, The Yale & Towne Mfg. Co.



Towmotor with upending roll clamp accessory,  
stacks 7000 pound liner board roll 17 feet high.

## **TOWMOTOR** makes new plant really modern!

It's not so ridiculous as it might sound! No plant—new or not so new—is truly modern unless materials are "mass handled" the Towmotor way. You can eliminate wasted time and inefficiency in every phase of your manufacturing, receiving, storage, processing and shipping. The savings made with Towmotor are immediate and substantial. You can apply them to your own business. Write for a Towmotor Certified Job Study on your own industry. **TOWMOTOR CORPORATION**, Div. 812, 1226 E. 152nd St., Cleveland 10, Ohio.

**TOWMOTOR**  
THE ONE-MAN-GANG

FORK LIFT TRUCKS  
and TRACTORS SINCE 1919

**TOWMOTORS** are made only by **TOWMOTOR CORPORATION**

Circle No. 143 on Reader Service Card for more information

DECEMBER, 1955



WITH A

## LAMSON AUTOMATIC PALLET LOADER

The First Automatic Pallet Loader... And Proven In The Field

### A LAMSON SAVES TIME

Lamson . . . the original Automatic Pallet Loader, can palletize up to forty cartons per minute . . . from one to seven different product lines. The Lamson Pallet Loader palletizes at the highest proven capacity with minimum product damage. Cartons fed from one or more accumulator lines are stacked in almost any pre-determined interlocking pattern.

### A LAMSON SAVES MAINTENANCE

Simplified design, employing proven type electrical circuits, makes any maintenance easy with ready access to all motors and working parts.

**LAMSON AUTOMATIC PALLET LOADERS STACK  
1,500,000 CARTONS EVERY 8-HOUR DAY IN:**



Esso Standard Oil Company  
Bayonne, N. J.  
1 of 13 loaders in the  
oil industry



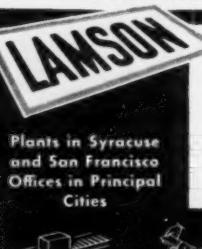
Anheuser-Busch, Inc.  
St. Louis, Missouri  
1 of 56 loaders in  
brewing industry



Lever Bros. Company  
Hammond, Ind.  
1 of 9 loaders  
in soap powder industry

**AND THESE INDUSTRIES:**  
Soft Drink • Floor Tile • Sugar •  
Chocolate Syrup • Shortening •  
Insulated Wire and others

WRITE TODAY for the free booklet which shows how  
you can save thousands of dollars yearly with the  
Lamson Automatic Pallet Loader.



**MAIL THIS COUPON TODAY!**

Lamson Corporation,  
2432 Lamson Street, Syracuse, New York  
Gentlemen: Please send me a free copy of your booklet on Lamson Automatic Pallet Loaders. This entails no obligation, of course.

NAME \_\_\_\_\_ TITLE \_\_\_\_\_  
COMPANY \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
CITY \_\_\_\_\_ ZONE \_\_\_\_\_ STATE \_\_\_\_\_

Circle No. 165 on Reader Service Card for more information

**HOW MUCH . . .**  
(Continued from page 62)

**E. Unnecessary manual re-handling** of an object goes with unnecessary exposure to accidents arising from these rehandling operations.

As the amount of handling is reduced, exposure to accidents is cut down. Therefore, whenever observations disclose that excessive rehandling exists, it is in order (from an accident prevention standpoint), to explore the possibilities of better handling procedures. The simple ideas should be studied first—use of tables and benches so that material can be kept off the floor; platform skids (for hand or power lift trucks) so that units of material can be moved about easily and kept on skids between process operations; simple monorail systems; and the like.

After a certain stage is passed, this proposition of reducing handling operations gets into straight line production and continuous flow of material on conveyor systems, etc.

### Inspection and Study of Accident Causes

The engineering phase of the problem need not be complicated nor difficult if certain fundamental factors are considered. Each accident or exposure should be evaluated on the basis of a careful study of the four following factors and their relation to existing conditions.

**Plant Layout**—Poor layout may be the cause of unnecessary or excessive handling of materials. Lack of adequate aisles or storage areas result in congestion and poor housekeeping conditions. These congestion and housekeeping conditions refer to those that are usually beyond the control of the supervisor. The only practical solution is often the provision of adequate space to store material in process.

Efficient plant layout minimizes manual handling and eliminates, as much as possible, interference of men and materials in the movement of stock in process.

**Practices and Procedures**—A study of each operation may reveal unsafe practices or lack of

proper instruction. More adequate training procedures for personnel may be necessary. Misuse or lack of understanding of the proper use of material handling equipment often result in accidents. Instructions on definite procedures in the safe use of industrial trucks, hoists, cranes, conveyors, etc., may be necessary. Lack of instruction in proper manual lifting technique or carrying operations, horseplay, overanxiety to compete, and "show-off" actions are other items which must be considered.

**Housekeeping**—Poor housekeeping conditions resulting from other than plant layout factors are many. Congestion and poor arrangement may be caused by lack of aisle maintenance of poor policing of storage within aisle boundaries. Improperly stored material, inadequate storage facilities (racks, bins, etc.) for raw stock and finished parts result in poor housekeeping. Poor floor conditions cause spillage and result in material handling accidents. These examples of poor housekeeping conditions are usually easy to control when recognized—but often go unnoticed in the average plant.

**Methods**—When studying the existing handling methods, the engineer attempts to reveal items that have a bearing on possible accident exposures. Two or three-man lifts, excessive handling between operations, inadequate material handling devices, excessive or unnecessary handling at machine tool or work stations are clues to further study.

The compilation of a process, operation or man-machine chart for each work station or each unit of material handling equipment may prove valuable. A methods study of each operation—outlined on paper, with excess handling and possible hazards noted—will reveal exposures that may pass unnoticed by visual inspection. Such a methods study may be concentrated at a single machine tool or operational cycle or may include the movement of material from one location to another.

Once this compilation of facts has been completed and the hazards spotted, the engineering pro-

## REDUCE FORK TRUCK MAINTENANCE COSTS!



Up to  
**30%**  
or more  
with

*an LP Gas-operated*  
**LAMSON MOBILIFT®**

The low maintenance costs of LPG fuel . . . proven in other industries . . . can now be enjoyed by fork lift truck users.

The economical operation, long life and versatility of Mobilift is further increased by this alternate fuel system.

#### THESE MOBILIFT FEATURES ASSURE YOU OF TOP ECONOMY AND EFFICIENCY:

A high free lift at standard costs makes stacking easier and faster. All Mobilift trucks are easily accessible to driver position. No cramped quarters. "Every-side" visibility assures smoother, safer operation. Lev-R-Matic direction controls provide instant fingertip operation . . . eliminate gear shifting. Mobil-Matic transmission assembly delivers power smoothly . . . adds years to the life of engine, transmission and drive axle. All engine parts are within easy reach.



Mobilift trucks . . . "stand-up" and "sit-down" . . . range up to 4000 lbs. in capacity. Discover how LP Gas-operated Lamson Mobilift trucks can cut your handling costs and time.

MAIL THIS COUPON TODAY



MOBILIFT CORP.  
Home Office  
Portland, Ore.  
Offices in principal cities

Lamson Mobilift Corporation  
5012 Lamson Street, Syracuse 1, N. Y.  
Please send me complete information on \_\_\_\_\_ Mobilift  
"sit-down" trucks \_\_\_\_\_ on Mobilift "stand-up" trucks,  
on \_\_\_\_\_ all Mobilift trucks.

NAME \_\_\_\_\_ TITLE \_\_\_\_\_  
COMPANY \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
CITY \_\_\_\_\_ ZONE \_\_\_\_\_ STATE \_\_\_\_\_



Circle No. 92 on Reader Service Card for more information



**CHRYSLER'S**

## **FORWARD LOOK** IN MATERIALS HANDLING



CHRYSLER STREAMLINES HANDLING WITH

# **MERCURY** "TRACKLESS TRAINS"

Chrysler Division's handling facilities call for mass movement of thousands of tons daily. Fast, dependable, economical hauling over long distances is a must in the Chrysler Jefferson plant, and the Mercury "Trackless Train" system provides the answer.

Flexibility is the number one advantage of "Trackless Train" operations. Loads are on wheels...readily movable by hand for short distances...motive power is free to perform other tasks.

Experienced material handling engineers from Mercury will be glad to furnish any data you desire. Consult the yellow pages of your phone directory. Write today for free literature on the Mercury "Trackless Train."



**MERCURY MANUFACTURING COMPANY**  
4154 South Halsted Street, Chicago 9, Illinois

Circle No. 166 on Reader Service Card for more information

### **HOW MUCH**

*Continued*

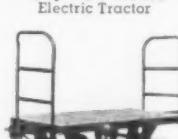
cedure of elimination, combination, change of sequence, or simplification through mechanization can be utilized to minimize material handling exposures.

**"The first consideration . . . is to provide every possible aid to minimize manual effort"**

An analytical approach to the solution of this accident prevention problem is necessary. It is important that the engineer consider the many elements of the recognized principles of efficient material handling. In most instances, he should deliberately restrict his approach to the simpler factors. For example, if hand trucks are used to move material from one process stage to another, the immediate job is to make certain that the trucks are adequate for the job, properly maintained and lubricated . . . that floors on which trucks are operated are in good condition . . . that traffic control is proper . . . that loads are piled safely. If he believes a major change in method should be made—say the purchase of a power truck and the use of pallets, or some form of a conveyor system—he should first consider all elements of power truck operation and palletizing. He should thoroughly familiarize himself with the various types of conveyors.

Manual handling will always be a problem to some degree. Even with increased mechanized handling, improved work positioning methods, and automation, manual handling will still be necessary on some operations. The problem, therefore, is: What should be done about it?

The first consideration under such circumstances is to provide every possible aid to minimize manual effort; second, to consider replacement and job placement programs to be assured of having the proper individual on the job—in keeping with his physical abilities to handle the manual requirements of the job. Last, of course, is the training of the individual to handle this job in the most efficient and least fatiguing manner.



**MERCURY**  
FORK TRUCKS-TRACTORS-TRAILERS

## MANUAL HANDLING . . .

(Continued from page 66)

Another factor is overall design in relation to ease of loading, security of load, and proper clearance for doors, aisles, and elevators.

Conditions of service should also be kept in mind when choosing the truck. An item of safety most often overlooked is the matter of noise. A noisy truck not only affects workers, general performance and health, but also might decrease an operator's awareness of unexpected dangers.

Proper maintenance is a further factor of safety. For example, a "frozen" wheel can cause a truck to swerve dangerously. Thus lubrication is an anti-accident matter. But all kinds of repair and maintenance are of utmost importance in accident prevention.

Also important in the general consideration of safety is the matter of correct truck use. Here, the first rule is "push—don't pull!" We still find many truckers who turn their backs to the load, drawing it behind them. Aside from the danger of the load shifting or falling, the pulling position far more easily leads to muscle strain—one of the most common of operator injuries—caused when a man's heels and lower legs are hit by the truck he is towing.

Another operational danger is overloading. The Caster and Floor Truck Manufacturers' Association recently established truck standards that give actual load ratings (See FLOW, Sept. 1955). But even with these it is important to make sure that the truck capacities are not violated by the operators, either on their own initiative or on instructions from others.

Correct load positioning is a big safety factor. Trucks should not be loaded so high that the operator's vision is obstructed.

Familiarity with operating conditions is also requisite to safety. Every new operator should be taken on a complete tour of all plant areas in which he will be expected to function, and his attention should be called to all general and special hazards.

(Continued on page 135)

# Westinghouse



Has "on-the-job" DEPENDABILITY with

# MERCURY



Mercury Platform Lift Truck  
moving ladle of melt from  
cupola to pouring station.

## MERCURY PLATFORM LIFT TRUCKS ASSURE TOP SERVICE— ELIMINATE UNDUE DELAYS—KEEP DOWNTIME AT MINIMUM

Maximum dependability of equipment is essential when moving 5000 lb. ladles of melt at 2800°F from cupola to pouring stations. Mercury platform lift trucks have successfully met this requirement for over 12 years at the Westinghouse Trafford Foundry.

Besides handling over 60% of the Foundry's entire 200 ton daily melt output, Mercury lift trucks and tractors handle and store approximately 50,000 patterns in this

foundry, one of the largest and most diversified in the country.

For low-cost material handling equipment, Mercury is your best bet. As originators of the famous "Trackless Train," Mercury tractor and trailer equipment is still considered the "standard" of the industry. For stacking, loading and transporting more tonnage over the long haul, see the Mercury Fork Truck—"Trackless Train" System before you buy.

"Banty" Model A-460  
Gas Tractor —  
3000 lb. D.B.P.



"Yak" Model A-430  
Fork Truck —  
4000 lb. capacity.



Model A-310 Trailer —  
Burden carrier of  
the "Trackless Train."



## A Complete Line of Industrial Trucks—Tractors—Trailers



Mercury Material Handling Engineers are located in all major cities of the United States and Canada. Consult the yellow pages of the telephone directory for the one nearest you. Write today for free literature illustrating and describing all Mercury products.

MERCURY MANUFACTURING CO., 4154 SOUTH HALSTED STREET, CHICAGO 9, ILLINOIS

Circle 106 on Reader Service Card for more information



**Not when you package with**

# KIMPAK

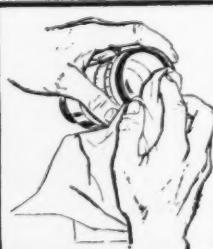
If you want positive protection against breakage — switch to Kimpak Interior Packaging!

Kimpak's outstanding shock absorbency shields your product from rough handling. Protects it from movement within the carton or crate, and from dirt and cinders that sift into the container. And this superior protection costs you no more than ordinary packaging materials!

**For immediate delivery —**

**JUST CALL, THAT'S ALL!**

Your local supplier is now prepared to deliver — in quantity — a wide variety of Kimpak widths and thicknesses to fit your exact specifications. Call him today!



*And here's another Kimberly-Clark product for your shop — Kimwipes Industrial Wipers. They're soft . . . disposable . . . absorbent . . . cost far less than ordinary wiping material. And Kimwipes wipe clean — without linting, scratching or streaking!*



**Kimberly-Clark Corporation • Neenah, Wisconsin**

Circle No. 90 on Reader Service Card for more information



DECEMBER 1955

## TABLE OF CONTENTS

The Safety-Efficiency Ratio in Cargo Handling .....	102
Product Safety . . . a Function of Packaging .....	104
Packaging and Shipping Idea of the Month .....	108
Packaging for Automation .....	110
Simple Carton for Complex Job .....	114

# An Easy Index to This Month's Advertisers

Are you looking for a particular type of packaging and shipping equipment? Listed below are advertisers according to type of product they are advertising in this issue. We have attempted to make your job a little easier by listing them as often as possible. To use this index, find the type

of product in which you are interested . . . turn to the advertisers listed under that product . . . circle the correct numbers on the reader service card, mail it, and you'll get complete information in a jiffy.

## DOCK COVERS

Capco .....	116
Dazzo Products Co. ....	120

## BULKHEADING

Evans Products Co. ....	117
-------------------------	-----

## CONTAINERS

Bigelow Garvey Lumber Co. ....	116
Continental Can Co. ....	109
Gaylord Container Corp. ....	106
General Box Co. ....	119

## CUSHIONING AND BARRIER MATERIALS

American Sisalkraft Co. ....	115
Kimberly-Clark Corp. ....	98
Thilmany Pulp & Paper Co. ....	118

## GLUES, TAPE AND TAPE DISPENSING EQUIPMENT

Derby Sealers, Inc. ....	116
Minnesota Mining and Manufacturing Co. ....	101

## MARKING AND STENCILING EQUIPMENT

Diagraph Bradley Industries, Inc. ....	122
Adolph Gottscho, Inc. ....	122
Sten-C-Labl, Inc. ....	120
Weber Addressing Machine Co. ....	123

## PACKAGE MACHINERY

Pak-Rapid Inc. ....	123
---------------------	-----

## STRAPPING, STAPLING AND STITCHING EQUIPMENT

Bostitch Inc. ....	107
Gerrard Steel Strapping Div., U.S. Steel Corp. ....	111
Signode Steel Strapping Co. ....	113
The Stanley Works, Strapping Div. ....	121
Union Special Machine Co. ....	114

# World's Strongest Tape?

*Even "Hard-Boiled" Haggerty  
can't break it!*



"SCOTCH" Brand Filament Tape—super-strong, amazingly shock resistant. Thousands of filaments embedded in the pressure-sensitive adhesive give it up to 500 lbs. tensile strength per inch of tape width. New exclusive "mirror-surface" adhesive gives 100% tape contact; *puts all the tape strength to work*. We'll be glad to send at your request complete information on how you can use it for materials handling and heavy duty packaging.

*There are more than*

## 300 Pressure-Sensitive Tapes

*for Industry trademarked...*

REG. U.S. PAT. OFF.

# Scotch

BRAND



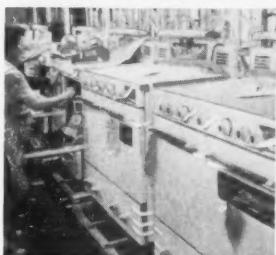
**Look what you can do with it!**



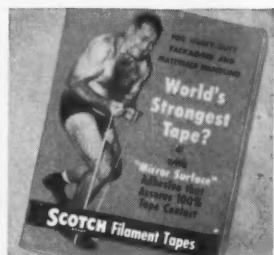
**BAND** odd sizes and shapes of metal stock into bundles. "SCOTCH" Brand Filament Tape secures such bundles weighing up to 800 lbs.; does it quickly, cheaply, safely.



**PALLETIZE** loads to prevent movement and shifting in handling and transit. "SCOTCH" Brand Filament Tape is easy to apply; easy to dispose of after removal.



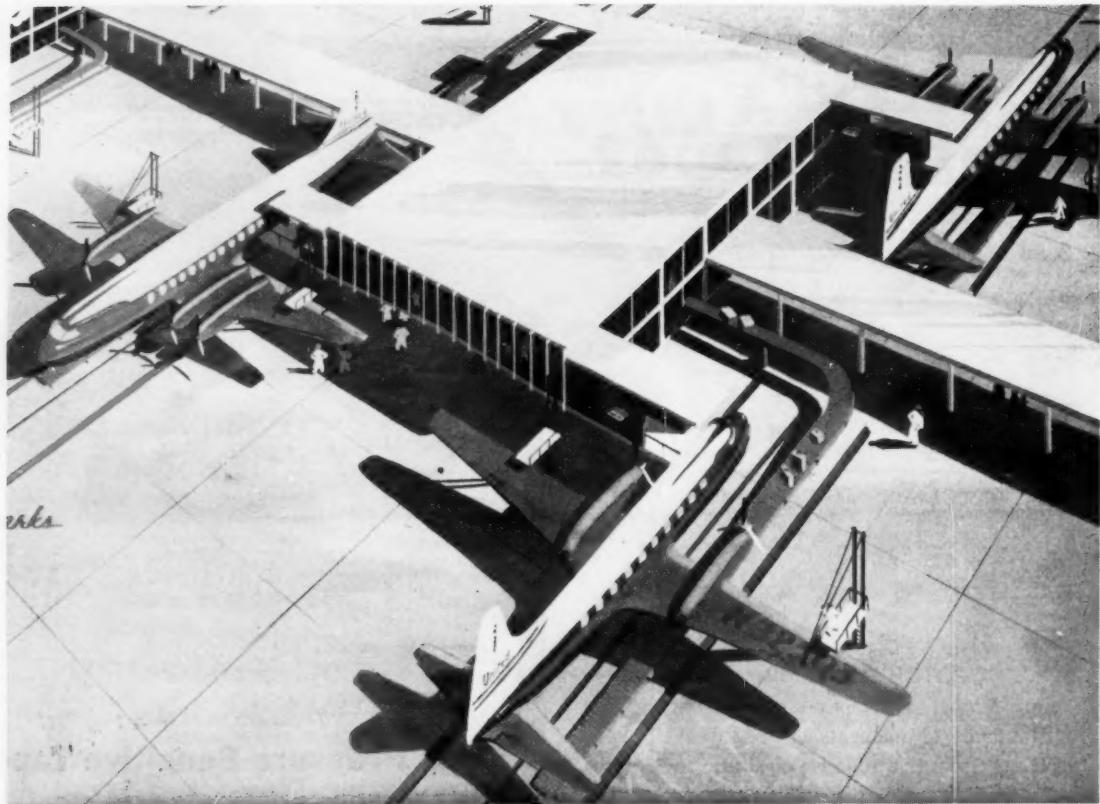
**PROTECT** enamel or stainless steel; fasten covers, hold doors closed with "SCOTCH" Brand Filament Tape. Will not mar surfaces; strips off clean.



**FREE FOLDER** on "SCOTCH" Filament Tapes. Gives physical properties, characteristics, use suggestions. Write on your letterhead to Dept. CG-125.

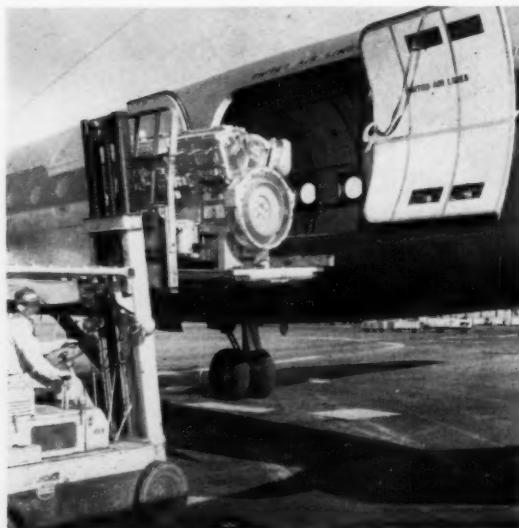
The term "SCOTCH" is a registered trademark of Minnesota Mining and Mfg. Co., St. Paul 6, Minn.  
Export Sales Office: 99 Park Ave., New York 16, N.Y. In Canada: P.O. Box 757, London, Ontario.

Circle No. 108 on Reader Service Card for more information



FULLY CONVEYORIZED airdock which United Air Lines has developed for efficient loading and unloading of super speed planes of tomorrow. Fully tested in a full-scale mockup at Denver, the device will meet

the demands of the jet-age when each lost minute on the ground will be equivalent to almost nine flight miles. By removing a number of various pieces of mobile equipment, safety would be much improved.



FORK TRUCKS have reduced the number of times a piece of cargo must be handled by ramp workers and so reduced exposure to accidents. Also have eliminated hazards of falling workers and falling objects.



PORTABLE CONVEYORS have taken the place of the old "bucket brigade" method of handling cargo on and off airplanes. United hopes to stop package-by-package handling with preloaded standard containers.

SAFETY-ENGINEERED  
HANDLING



# The Safety-Efficiency Ratio

. . . in cargo handling

MANY have noted that efficiency and safety go hand-in-hand, but seldom has the relationship been so clearly demonstrated as in the cargo-handling experience of United Air Lines.

Throughout its first 20 years of operations, United used the "bucket brigade" method of handling cargo. Loading and unloading were accomplished by the simple process of passing cargo items from man to man. Hand carts were employed to move shipments between the plane and cargo depot. Aircraft fuselages were low to the ground (tri-cycle landing gear had not been developed) and in most cases cargo pits were accessible from a standing position.

Even when larger planes, such as United's DC-3 Mainliners, entered service, bucket brigades continued to be the standard way to handle cargo. Three-man crews were required to load the DC-3 forward pit, located just behind the pilot's compartment. One man stood on the ground and handed items to another who perched on a stand beside the aircraft nose. The third man, inside the plane, stowed the upcoming cargo.

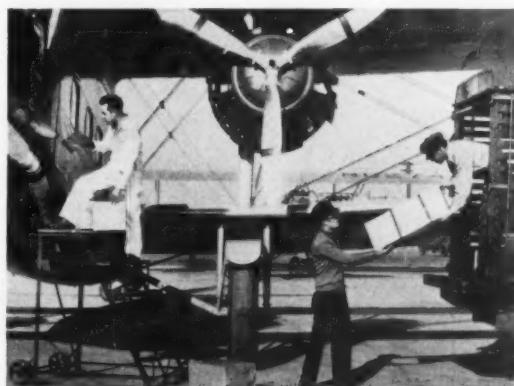
Efficiency was not foremost among the meager virtues of the bucket brigade method . . . nor was safety. Heavy cargo handled by sheer manpower resulted in strains, back injuries and more serious mishaps when falls occurred. The possibility of a worker losing his balance on the nose stand was always present and the low man in the path of falling objects.

Bucket brigades were able to keep up with DC-3

Mainliners, which carried 21 passengers and 2750 pounds of baggage, mail and express, but the advent of larger planes with more than double this capacity called for a sharp change in procedure. Soon after introduction of DC-4 Mainliners, which accommodate 44 passengers and 2½ tons of cargo, United discovered that bucket brigades could keep up with pounds but not with tons. In 1946 an extensive mechanization program was started. Fork trucks and tractor-trailer trains were acquired for all major stations on the company's system.

Fork trucks reduced the number of times a piece of cargo had to be handled by ramp workers and so reduced exposure to accidents. The devices also eliminated cargo loading stands and with them the hazard of falling workers and falling objects. Tractors and trailers ended the strains and back injuries caused by tugging and pulling hand carts. A dramatic decline in certain types of accidents occurred within a year, as shown by the table at lower left.

(Continued on page 131)



"BUCKET BRIGADE" method of loading and unloading aircraft was used by United and other air transport companies for 20 years. Besides being inefficient, it was a source of accidents due to strains and falls.

Percentage of total accidents		
Year	Falls, Slips	Lifting
1942	23.0	11.0
1943	20.0	11.0
1944	24.0	10.0
1945	23.0	15.0
1946	14.0	6.0



RUBBERIZED HAIR padding was used by Douglas Aircraft Co., Inc. to give a "floating" effect and safeguard radome during handling and shipping. The radome is fastened to a tray which is placed on several thicknesses of rubberized hair. Packages have withstood severe rough-handling tests.



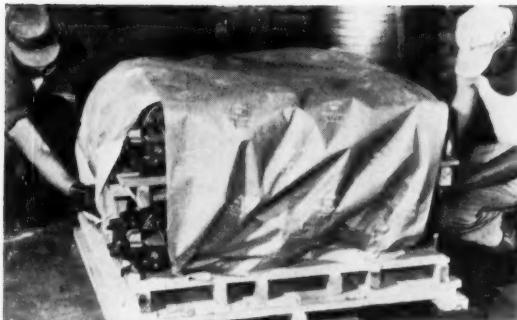
WOOD SHAVINGS are used here for protection of finely machined replacement parts for heavy machinery. Shavings completely fill wirebound to prevent parts from shifting and damaging each other.

## PRODUCT



CYLINDRICAL TANK had tendency to roll off flat car in transit with ordinary loading method. Problem was solved through use of specially-designed saddles and

two-inch flat steel strapping. The tank is lowered onto the saddles by over-head bridge crane and is strapped. Demountable legs are strapped to floor at end of car.



UNIT LOAD for shipping transmissions from Borg-Warner factory consists of: two special pallets with wooden cross-pieces which form "nests" in which units fit; corrosion inhibiting paper cover; waterproof paper shroud; and wirebound wrap-around mat. Inside cleats on mat engage top of box and base of each pallet.



## SAFETY...A Function of Packaging

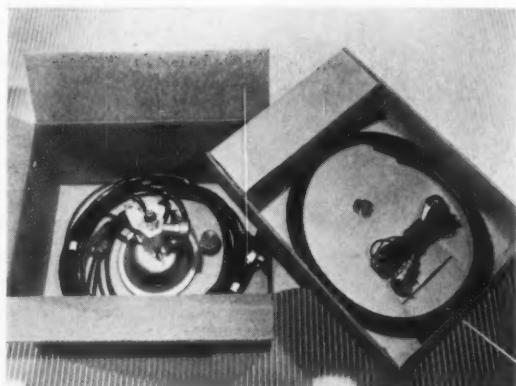


SAFETY-ENGINEERED HANDLING

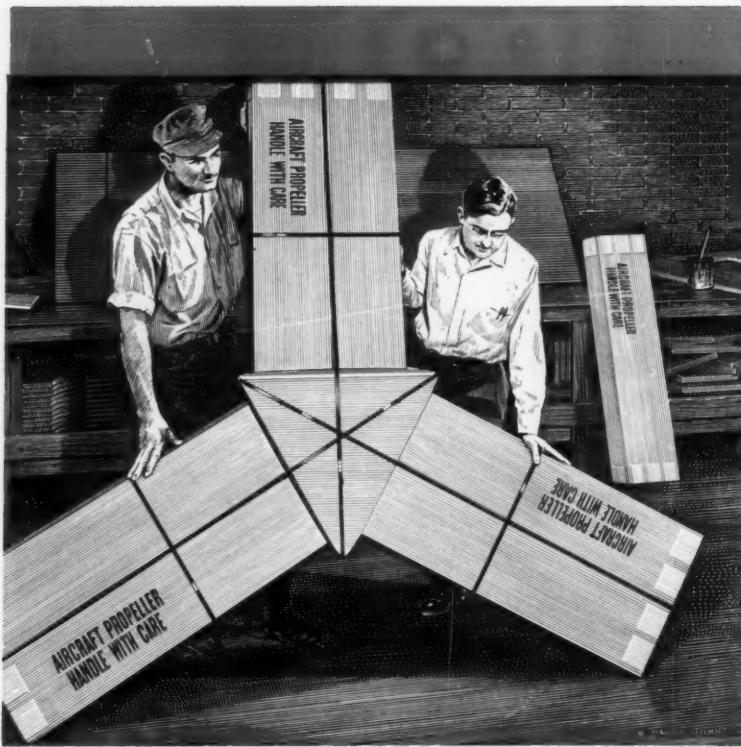
**P**RODUCT safety is one of the most vital responsibilities of the packaging engineer, and a thorough understanding of damages and how to protect against them is essential.

The American Association of Railroads revealed, in a recent survey, that its members reported over \$111,000,000 in claims during 1953. The dollar total does not include time-loss or customer good-will loss. The report stated that damages accounted for 81.9% of all claims; misplaced and misdirected items for 14.5%; delays for the remainder. It is clear that the greatest area for savings is in the reduction of damages.

Obviously, it is a virtual certainty that we will never find the ideal handling situation where the packaging engineer will have devised an economical means of protection strong enough to withstand all normal transit hazards, or the ideal package where the material handling engineer will have developed a transporting and storing method which removes all threat of damage. It is necessary, then, that packaging and material handling men aim their efforts so that a combi-



CORRUGATED BOX uses only two interior packing pieces to hold lubricating device and give two-way safety. Die-cut pad at bottom of the box fits around diaphragm. Other die-cut pad fits on top of the unit, holding the tubing in place and providing place for the safe shipment of lubricant feed lines and wiring.



## FAST PACKING FOR ODD SHAPES

*The three-bladed airplane propeller shown above formerly required a costly, bulky, custom-built shipping container. Today it is packed for safe shipment with production-line efficiency . . . in a specially developed, lightweight Gaylord corrugated container.*

*Whatever the size, shape or texture of your product . . . its unusual requirements are a challenge to Gaylord container design engineers. Let us explore the possibilities for packing your product in a modern, money-saving corrugated container. Call your nearby Gaylord office.*



CORRUGATED AND SOLID FIBRE BOXES  
FOLDING CARTONS • KRAFT PAPER AND SPECIALTIES  
KRAFT BAGS AND SACKS

GAYLORD CONTAINER CORPORATION • ST. LOUIS

SALES OFFICES FROM COAST TO COAST • CONSULT YOUR LOCAL PHONE BOOK

Circle No. 62 on Reader Service Card for more information

## PRODUCT SAFETY

*Continued from preceding page*

nation of both will achieve the required product safety.

### What Causes Damages?

Liberty Mutual Insurance Co. of Boston lists the following poor practices as those most likely to cause damage to freight in motor carrier shipments:

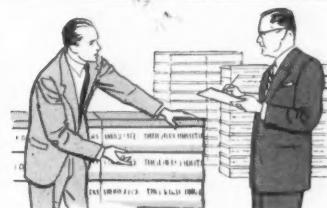
1. Rough handling of fragile merchandise.
2. Stowing cartons containing cans, glass jars, or bottles on edge.
3. Stowing cases containing liquids in cans with pry-off tops up-side-down.
4. Stowing cases or drums containing liquids that might leak on top or near expensive dry freight.
5. Stowing any merchandise in such manner that motion of the truck will cause it to shift or to fall and break or damage other freight by fall.
6. Loading cylinders or reels without proper blocking to stop them from rolling.
7. Loading cases, cartons, etc., up-side-down or on edge when clearly marked "This Side Up".
8. Loading cartons, rugs, etc., on top of castings, iron, machinery or other rough freight without protection.
9. Loading dry freight on bodies without proper tarpaulin protection.
10. Loading dry freight on bodies with holes in roof, floor, sides, or doors which leak.
11. Loading freight in bodies without proper rear doors or curtains.
12. Storing fragile freight on floor and heavy freight on top.
13. Improperly securing with ropes, top covers or curtains—or insecure fastening of doors.
14. Stowing full or empty drums with bungs down.
15. Receiving freight not properly packed.

*(Continued on page 116)*

# How 16 husky staples help save \$1 a load



## THE PROBLEM:

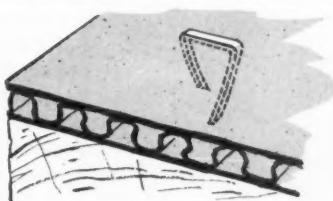


In a leading paper mill, heavy printing stock was moved on mill pallets by lift truck. Such wooden platforms were so costly for customers that often cartons had to be hand-loaded.

Too, not all customers used lift equipment. Many objected to paying extra for "useless pallets." Orders from these customers meant special handling, added expense.

The problem: find a way to keep handling costs down on all orders. Could stapling be the answer? Bostitch had helped cut costs on other jobs in the mill—why not this one, too?

## THE SOLUTION:



A Bostitch Economy Man and the mill's engineers worked out the answer—a "give-away" pallet: corrugated board quickly stapled to scrap lumber with a Bostitch H4 Hammer.

Four small wood strips raise the load just enough for lift truck chisel forks to slip under. Sixteen  $\frac{3}{4}$ " heavy-duty Bostitch staples secure strips. Boxed load supports itself between forks.

Entire pallet costs less than 40c. Customers get pallets free, save handling when unloading. The mill saves pallet storage space and hundreds of dollars in handling, billing and salvage costs.

**How much can you save by switching to Bostitch?** Your Bostitch Economy Man will work out answers for you without cost. He's one of 375 trained fastening specialists working out of 123 cities in the U. S. and Canada. Over 800 kinds of Bostitch staplers for business and industry. Look for "Bostitch" in your telephone directory. Or mail coupon.

**Fasten it better and faster with**

**BOSTITCH®**  
STAPLERS AND STAPLES

**BOSTITCH, 712 Mechanic Street, Westerly, R. I.**

You say you can save my company money on fastening costs. Okay, prove it!

Name \_\_\_\_\_

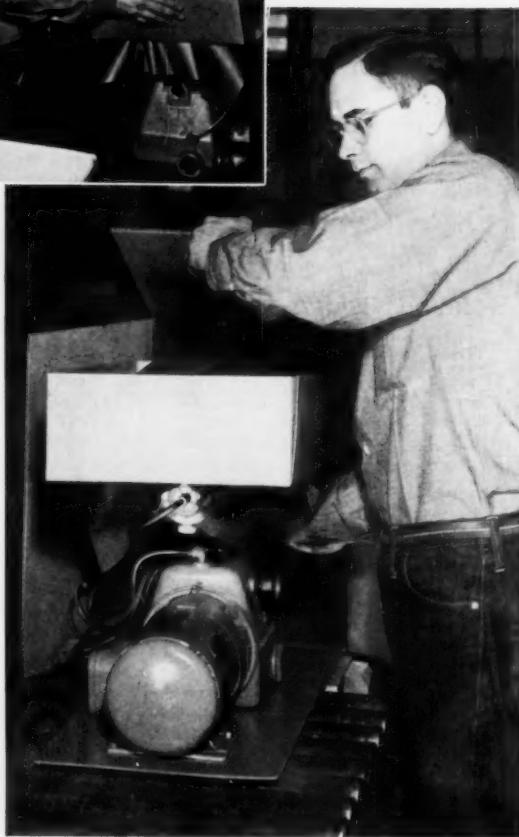
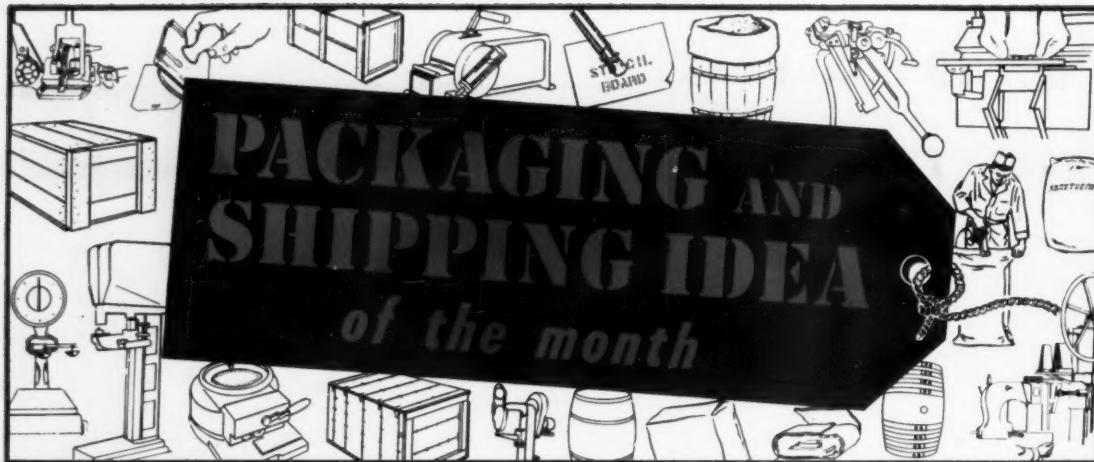
Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

Circle No. 21 on Reader Service Card for more information

DECEMBER, 1955



## Corrugated Box Provides . . . Protection for Heavy Unit

**F**AIRBANKS, Morse & Co.'s Westco Plant adopted corrugated shipping boxes for its three-gallon household water pumps and reaped important benefits in product protection, lower packaging costs and improved handling and warehousing. As a result of the highly successful changeover, pumps with tanks up to 42 gallon capacity will eventually be shipped in the same manner.

The corrugated box for the three-gallon pumps is made of 350-pound test cylinder board and has inside overlapping flaps plus full overlapping flaps top and bottom. Hand holes are provided for easy handling.

The packaging operation actually starts before the pumps enter a spray booth where they receive a final coat of paint. Before entering the booth, the units are placed on a 175-point solid fibre base. After painting, they progress on conveyors to the packing station where they are bolted onto the base.

A sheet of specially treated paper, placed over the tank top to avoid marring the paint, is held in place by a die-cut sunburst opening which is part of the top lid. A small box containing parts is wired to the lid before it is positioned and instruction sheets are enclosed.

When the pump is ready to be inserted into the outer shipper, it is effectively braced at the top by the tray and at the bottom by the fibre base. Final step in the extremely simple packaging operation is to slip the pump assembly into a shipping container which is held in position by a special wooden jig. Closure is accomplished by stapling.

*Courtesy, Gaylord Container Corp.*

# INDUSTRIES EVERYWHERE . . .

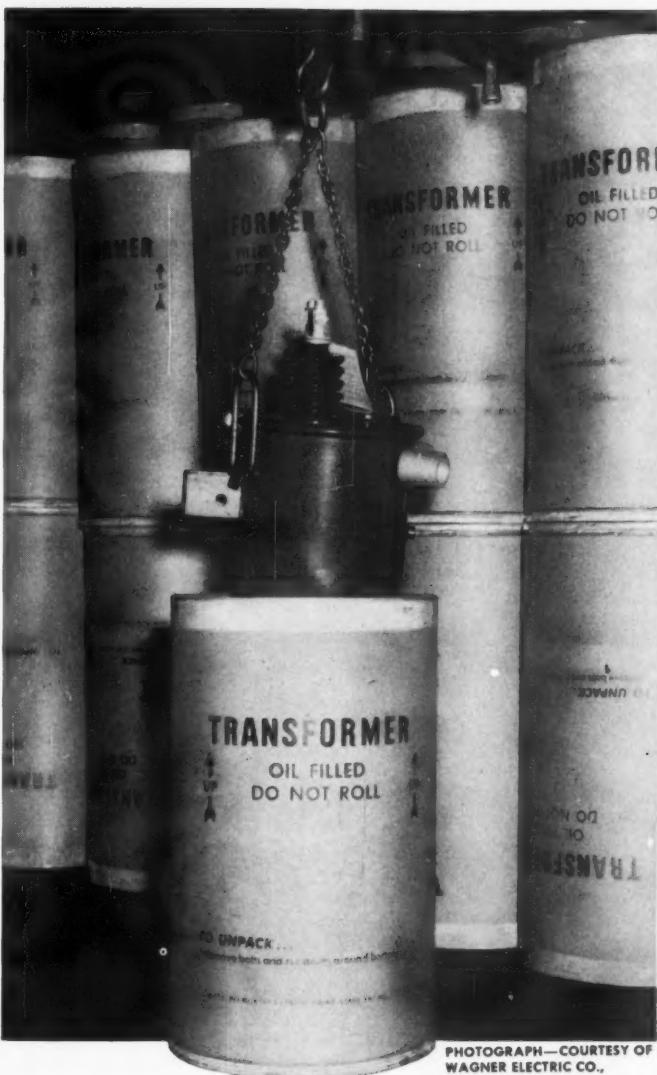
## solve shipping problems with versatile, low-cost Continental fibre drums

### Transformers pack snugly and safely in Leverpaks

When you've got an expensive piece of equipment like a transformer to transport, you must be sure of the container you pack it in. Some of America's top transformer manufacturers depend on Continental LEVERPAKS, the low-cost fibre drum that's sturdy enough to take almost any kind of hard knock. Suitable internal supports anchor the transformer firmly and safely in place.

Transformers, wire, bottles, dry chemicals—you name it—Continental has a fibre drum to ship it in. Besides LEVERPAK, we make STAPAK and FIBERPAK. Each is designed to do a special job. Find out how they can save you money, give you the best shipping service you've ever had. For the best in fibre drums—come to Continental.

*Available in any size, style or design*



PHOTOGRAPH—COURTESY OF  
WAGNER ELECTRIC CO.,  
ST. LOUIS, MISSOURI



FIBRE DRUM DIVISION • VAN WERT, OHIO

New York • Philadelphia • Pittsburgh • Tonawanda • Cleveland • Chicago  
Atlanta • St. Louis • San Francisco • Los Angeles • Eau Claire • Boston

Circle No. 35 on Reader Service Card for more information

DECEMBER, 1955



FILAMENT TAPE belt, to which resistors or capacitors are adhered, are wound on corrugated reels for shipment to customer. Method is designed to suit requirements of mass-production techniques in the electronics industry. It does not replace conventional sleeve-in-tray type packs for small quantity users or firms not equipped to handle corrugated reels.

## Packaging for Automation

**A**UTOMATIC belting of fixed resistors and capacitors on narrow belts of pressure-sensitive tape is helping the Allen-Bradley Co. of Milwaukee to keep pace with the growing demand for automation in the electronics industry. As a result, the firm is now in a position to supply resistors and capacitors in any quantity on expendable nine and 12-inch roles holding from 1000 to 2500 units each.

The reel packaging method is designed to supply the industry with a mass production device to meet the input requirements of various inserting machines. Officials of the firm are careful to point out, however, that the reels do not replace conventional sleeve-in-tray type packs for small quantity users or for firms not equipped to use the reels.

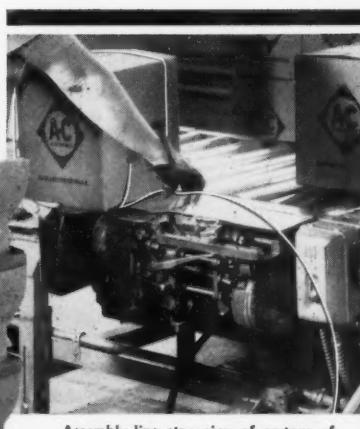
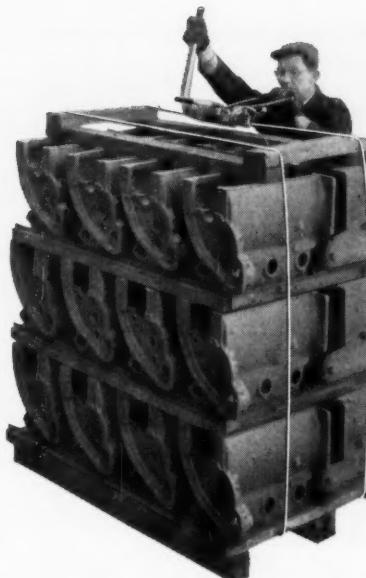
The current reel packaging program followed the

adoption of a unique automatic taping machine designed in the firm's fixed resistor department. The machines used by the company are units standing about four feet high, three and one-half feet long and 26 inches wide. They weigh about 350 pounds each. A 1/20 hp. electric motor inside each unit runs a simple chain-drive mechanism that operates the indexer (sprocket type wheel that uniformly feeds the individual resistors or capacitors to the tape) and the rewind reel.

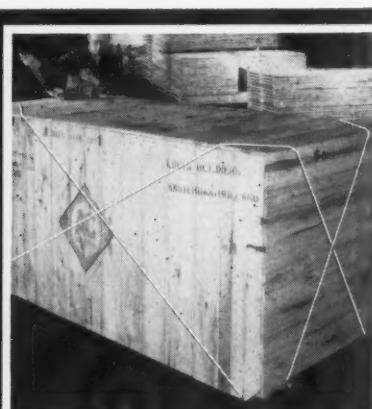
Each machine, manned by a single operator, has a production capacity of between 10 and 20 filled reels (more than 20,000 individual units) per hour. To maintain this production the operator's only duties are to replenish the supply of tape, reels and units be-

# USS GERRARD

## ties anything you've ever seen



Assembly-line strapping of cartons of Allis-Chalmers engine parts with USS Gerrard Round Steel Strapping and the Model Q machine.



A tractor packaged for export shipment, being reinforced with a diagonal tie of USS Gerrard Round Steel Strapping.

Allis-Chalmers engine blocks, 24 to a pallet, being reinforced for shipment with USS Gerrard Round Steel Strapping. Pallet weighs 4,000 pounds.

Allis-Chalmers Manufacturing Company, Tractor Works, West Allis, Wis., reinforces packages of all sizes quickly, securely, and inexpensively with **USS GERRARD ROUND STEEL STRAPPING**

When Allis-Chalmers West Allis, Wis., Tractor Works began packaging replacement parts in cartons to improve its shipping operation, USS Gerrard Round Steel Strapping was chosen as reinforcement. As a result, it provides a neat, inexpensive way to close cartons quickly, protects the product, saves the carton for re-use, and displays the advertising on the

box continuously.

Allis-Chalmers is using USS Gerrard Round Steel Strapping to secure packages which vary from 4-inch-square boxes, weighing less than a pound, to huge 38" x 30" x 34½" cartons which weigh up to 3,000 pounds. Even complete tractors are disassembled and crated for export to reduce cubage charges. They, too,

are reinforced with USS Gerrard Round Steel Strapping.

Take a tip from a highly successful organization, and try USS Gerrard Steel Strapping — Round or Flat. Whatever your packaging-tying problem might be, our engineers can help you find the safest, most economical solution. Contact us now.

GERRARD STEEL STRAPPING DIVISION, UNITED STATES STEEL CORPORATION  
GENERAL OFFICES: CHICAGO, ILLINOIS



— SEND FOR THIS NEW BOOKLET NOW —

Gerrard Steel Strapping  
2937 West 47th St., Chicago 32, Ill.

Please send me, free of charge, the new 36-page GERRARD Blue Book of Packaging.

Name .....

Company .....

Address .....

City ..... State .....

# USS GERRARD

## STEEL STRAPPING

Round and Flat

UNITED STATES STEEL

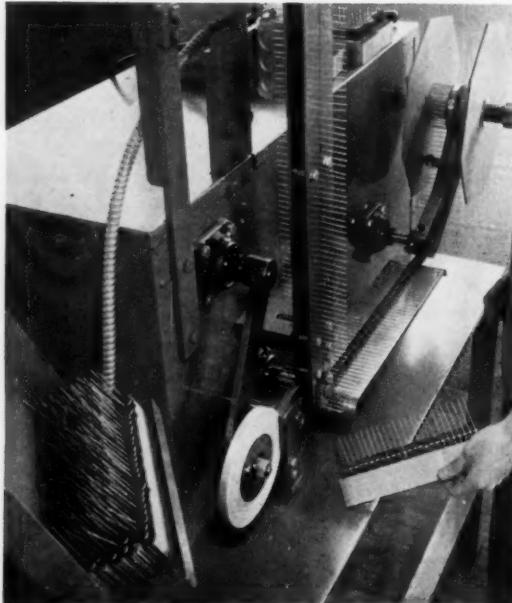
Circle No. 66 on Reader Service Card for more information

DECEMBER, 1955

## PACKAGING FOR AUTOMATION



**PACKAGING MACHINE** which is used by Allen-Bradley Co. to put resistors and capacitors on pressure-sensitive filament tape belts has capacity of 10 to 20 reels (more than 20,000 individual units) per hour. Operator controls tape flow with a foot-pedal.



**OPERATOR** has only to maintain supply of units and renew supply of tape when a roll is exhausted. Remainder of the packaging operation is fully automatic.

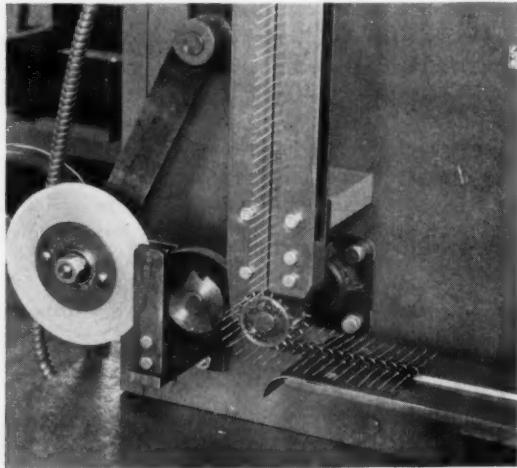
ing belted and to control the flow of tape-belted with a stop-start foot pedal.

Readyng a machine for use takes the operator only about one minute and calls for the following steps:

1. Mounting a 60-yard roll of filament tape (either  $\frac{1}{4}$  or  $\frac{3}{8}$ -inches wide, depending on the size of the resistors or capacitors to be belted).
2. Threading the tape, adhesive side up, between a rubber pressure roller and the indexer and pulling out about a foot of tape to act as a leader.
3. Loading the vertical feeder slide with  $\frac{1}{2}$ -watt, one-watt, or 2-watt units from pre-filled corrugated paper sleeves holding from 25 to 50 units each.
4. Starting the machine which, in turn, automatically begins applying the units to the tape and feeding the leader end of the tape out until it can be attached to the rewind reel.
5. Attaching the tape-leader to the reel's core completes the operation.

During production, the number of reels that can be completed with one 60-yard roll of tape depends entirely upon the size of the units being belted. For example, it takes about 52 feet of tape (allowing one foot on each end as a leader) to complete one 2500 capacity reel of  $\frac{1}{2}$ -watt units and about 42 feet to fill a 1000 capacity reel with two-watt units. In the former case about three and one-half reels can be

*Courtesy Minnesota Mining and Manufacturing Co.*



**TAPE** is threaded between rubber pressure roller and indexer (adhesive side up). About one foot of tape is pulled out as a leader at the beginning of the roll.

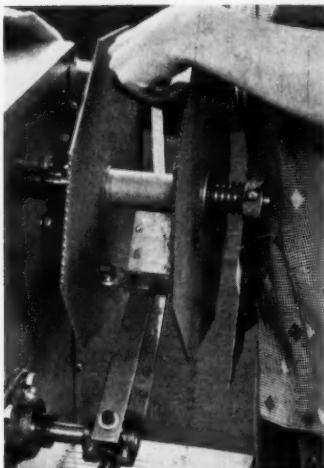
*Continued*

completed with one roll of tape and in the latter instance about four and one-third reels is tops.

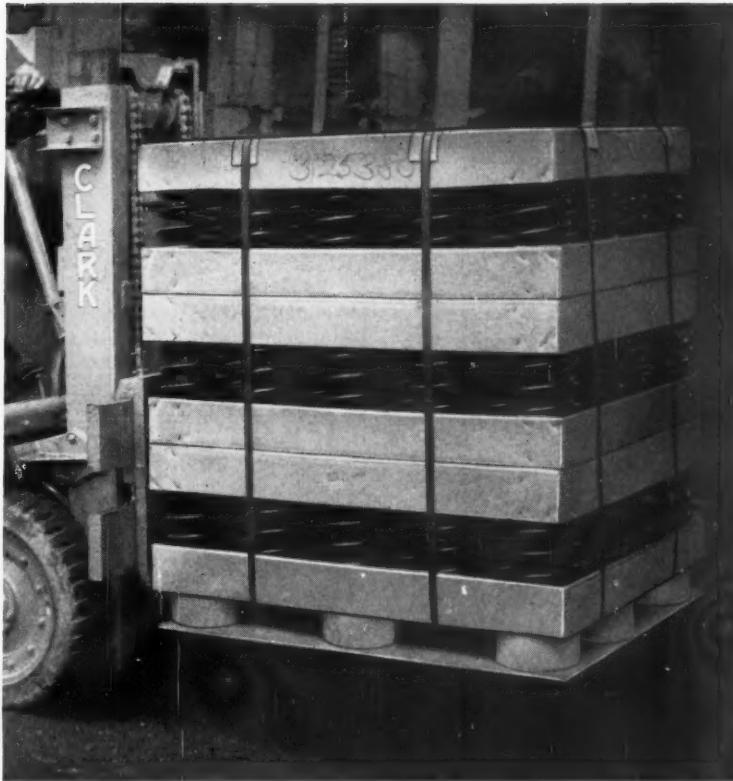
The 12-inch leaders that precede the first unit and trail off from the last unit on the belt are designed to facilitate loading into customer machines.

The expandable nine and 12-inch reels being used by Allen-Bradley have a one-inch diameter core upon which the tape-belt is started and octagon-shaped side shields of fibreboard construction. Their width varies from 3 $\frac{3}{4}$  inches for belted 1/2-watt units to 4-1/32 inches for 2-watt units.

To ready the filled reels for shipment, the packaging department merely tapes a cardboard retainer ring around the circumference of the belted units and then packs the reels in individual cartons. Six such cartons are then placed in a master carton for shipment.



TAPE LEADER is stuck to core of empty reel. Units are then wound onto reel in one continuous belt.



## Unitizing eliminates two handlings —cuts cost!

Automotive springs formerly were shipped to the factory loosely piled in a freight car. Two handlings and many hours later they arrived at the assembly line.

Today, almost universally, automotive springs are loaded on 35 $\frac{1}{2}$ " x 39 $\frac{1}{2}$ " expendable\* tray-top pallets which are *unitized* into strong, lossproof units that move directly from the freight car to the assembler—*eliminating two handlings!*

This change in handling methods reduced handling and labor costs, saved on demurrage charges, reduced stenciling and marking costs, eliminated loss of products, reduced pallet storage costs, and released tote boxes and trucks for other in-plant uses.

### Methods adaptable to many products

Signode methods of unitizing now are used to simplify handling of small containers, subassemblies, component parts, and a wide variety of finished products. These methods effect many savings for both shipper and receiver. For a complete survey of your packaging and shipping methods—with an eye toward greater economy—write



2618 N. Western Ave., Chicago 47, Ill.

Offices coast to coast. Foreign Subsidiaries and Distributors world-wide.

In Canada: Canadian Steel Strapping Co., Ltd., Montreal • Toronto

\*Fiberboard expendable pallets licensed by Addison-Semmes Corp.

Circle No. 129 on Reader Service Card for more information

**BAG CLOSING MACHINES  
FOR EVERY NEED . . .**



**...from UNION SPECIAL'S  
Complete Line! . . .**

FOR lower production costs . . . stronger, neater closures . . . ability to get out rush orders in a hurry, you can't beat Union Special Bag Closing Machines! Specially built to stand up under heavy production schedules, these machines provide the high output rates needed to meet modern competitive conditions.

In the Union Special line, it's easy to find the right unit to meet your particular requirements. **ASK FOR RECOMMENDATIONS.**

*Ask for  
Recommendations*

UNION SPECIAL MACHINE CO.  
415 N. Franklin St., Chicago 10, Ill.

Gentlemen: Without obliging me, please furnish information on bag closing equipment to handle the following production:

Kind of bags used? \_\_\_\_\_

Filled weight of bag? \_\_\_\_\_

Material being packed? \_\_\_\_\_

Maximum bags per minute? \_\_\_\_\_

Check - weighing required? \_\_\_\_\_

Conveyor required on Machine? \_\_\_\_\_

Power:  D.C.,  A.C., Volts \_\_\_\_\_

Phase \_\_\_\_\_ Cycles \_\_\_\_\_

Name \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

Circle No. 148 on Reader Service Card

114

# Simple Carton for Complex Job

A complex packaging problem was solved by a combination of exterior and inner-pack ideas in a corrugated carton designed for shipment of Viking Air Conditioning's new "Aqua-Magic Humidifier".

The humidifier's odd shape, plus components making up the complete "kit" which is shipped, presented a possible need for considerable costly pre-packaging, die-cut fixtures, padding, etc. The container finally developed uses two simple, easily applied inner-pack sections.

A corrugated taped tube, scored and folded square to fit in the bottom of the carton as a sleeve base, supports the product at its face-plate, holding it off the bottom of the carton. The tube also reinforces the sides and bottom of the box.

A flat, scored corrugated strip, folded into a compartmented unit and inserted on top of the face-plate, between the product and the front of the carton, forms three different size compartments for a box of accessories, a coil of tubing, envelope of fasteners and literature. It serves as a product top support and structural reinforcement for sides and top of the carton as well.

Courtesy American Box Co.



1. TAPED TUBE, folded into square shape, is inserted into box to support humidifier unit.

2. FACE PLATE of humidifier rests on edges of inner tube when product is placed in box.

3. COMPARTMENTED UNIT, made from flat, scored corrugated strip, fits in front of the Viking humidifier.

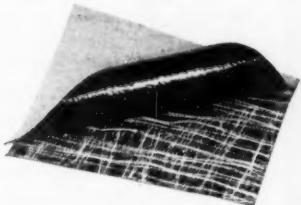
4. Accessories, tubing, fasteners and literature fit into compartments at top of the box.

**FLOW**

If you ship in Boxes now...

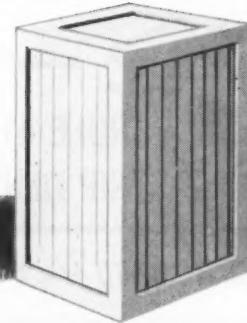


Take a look "under the hood"  
at rugged, waterproof FIBREEN



Note the combination of double layers of wire-strong fibers, waterproofing adhesive and paper. So tough you can hardly tear it — yet it's pliable. FIBREEN can take prolonged soaking, heat and cold and rough handling in stride.

Any width available for your particular product! Light and heavy duty, including non-staining grades.



A CRATE  
PLUS  
FIBREEN

Saves You Money!

Shippers are finding that they can lighten their loads and *lighten their costs* when they ship in crates with contents wrapped in FIBREEN. FIBREEN is rugged, waterproof paper that seals against dirt, moisture, salt and smoke. It's pliable too, wraps quickly, easily, snugly around anything shipped — including products with irregular shapes — furniture, machinery, etc.

Why not investigate these savings  
in packaging and shipping costs?



AMERICAN SISALKRAFT CORPORATION  
Dept. FL-12, Attleboro, Massachusetts

Please send free samples and packaging information on FIBREEN.

Name.....

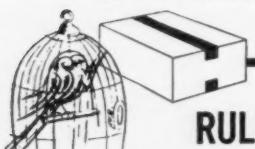
Company.....

Address.....

City..... Zone..... State.....

Circle No. 9 on Reader Service Card for more information

Circle No. 44 on Reader Service Card for more information



IT ONLY TAKES 2 . . .

## RULE 41 AMENDED TO ALLOW 2-STRIP CENTER-SEAM SEALING

CUT COSTS UP TO  $\frac{2}{3}$  WITH

Filament Reinforced Sealing Tapes  
And The FAMOUS

### DERBY 32-T

The first important closure method change in 40 years! . . . now use 2 strips of tape for all shipments! The Derby 32-T especially designed to dispense all brands of tough filament reinforced tapes quickly, easily, accurately!



Cut Your Shipping Room Costs!  
Write now, Dept. F for free booklet about 2 strips and the Derby 32-T



**DERBY SEALERS, INC.**  
DERBY, CONNECTICUT

### CAPCO DOCK COVERS GIVE YEAR 'ROUND PROTECTION

CAPCO Dock Covers completely enclose the space between car and building doorways protecting loading and unloading during bad weather . . . preventing accidents . . . insuring against loss of heat or refrigeration. 51 different models in any size for every loading problem.

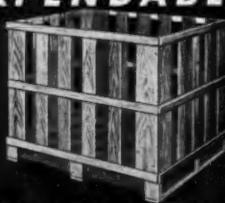


Write for literature  
and name of nearest distributor.

**CAPCO**

622-24 PROSPECT AVENUE • KANSAS CITY 24, MISSOURI

### BIGELOW GARVEY'S EXPENDABLES

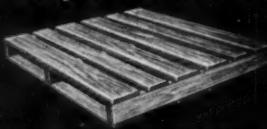


- inexpensive pallet crate
- shipped in two pieces
- quickly assembled
- made to your requirements

HARD WOOD OR SOFT WOOD

### PALLETS

all styles and sizes



30 YEARS MATERIAL HANDLING EXPERIENCE

MISSOURI ARKANSAS IOWA WISCONSIN MINNESOTA ILLINOIS

ALWAYS CHECK  BIGELOW-GARVEY

GENERAL OFFICE AND LABORATORY

226 W. HURON STREET • CHICAGO 11, ILLINOIS

Circle No. 30 on Reader Service Card

116

Circle No. 18 on Reader Service Card

### PRODUCT SAFETY . . .

(Continued from page 106)

16. Dropping freight from tail gate to street.
17. Allowing rugs to drop on ends.
18. Improper use of material handling equipment.
19. Excessive and rough handling of materials in bags and bundles.
20. Failure to remove nails from floor of truck.
21. Stowing freight likely to absorb odors next to freight giving off odors.

### What Can the Packaging Engineer Do?

Damages to products shipped by rail, air freight or marine transport are likely to be results of practices similar to those listed above. The material handling engineer, on one hand, must be constantly vigilant in trying to eliminate damage-producing conditions; The wise packaging engineer, on the other hand, will design his shipping units so as to protect against any and all of those conditions.

Solutions need not be complicated or expensive. Take, for example, the unique semi-floating pack designed for shipment of Douglas Aircraft Co.'s A3D radome. Principle feature of the pack is a "floating" effect obtained without the use of conventional mechanical shock mounts. It consists of the application of several thicknesses of rubberized hair at the corners. The radome is fastened to a tray which is placed on the cushioning material and held in place by cleats. Severe vibration and shock tests have not been able to damage the radome in spite of its fragile nature.

Even more simple, but just as effective in accomplishing its aims, is a package developed by a Mid-Western firm for shipment of replacement parts for heavy machinery. Although the parts are not fragile, their machined surfaces require they be prevented from touching one another. To solve its problem, the firm packs

**FLOW**



# The Kid Glove Treatment!

That's what both railroads and shippers call Evans DF\* equipped cars. And with good reason . . . because box cars so equipped transport lading so well that damage in transit is virtually eliminated.

DF equipped cars provide a cost-and-time-saving service to shippers who need no longer pay for "deadhead" dunnage. They are designed to permit no slack . . . no damaging load-shifting . . . and full-car capacity loads are easily planned through multi-decking.

Heavier loads per DF car are now increasing revenue per car mile for forty-two Class I railroads.

DF cars are in constant demand as more shippers become aware of this "kid glove treatment" for their freight.

\*DF, a trademark of Evans Products Company . . . only Evans makes it!

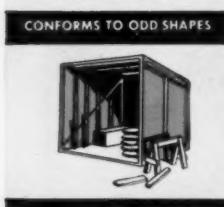
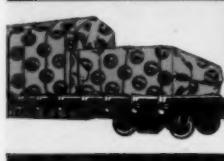


...LOCKS IN LADING, ELIMINATES  
DAMAGE AND DUNNAGE

**FREE BOOKLET!** There's much more to the DF story of interest to both railroads and shippers. Write today for your copy of this interesting brochure to Evans Products Co., Dept. AF-12, Plymouth, Mich. Circle No. 56 on Reader Service Card for more information

**Through rain, sleet or snow... sun, heat and dust...**

## NO OTHER PAPER PROTECTS LIKE WATERPROOF Wrap-DRI



**Thilco Papers Include**  
Glassines and Greasespreads,  
Water-Vapor Barriers, special  
treatment papers, MG and MF  
Krafts and Special Bags — most  
of them can be custom DECO-  
RATED to your exact requirements.

### NOW—with Controlled Pattern reinforcing for maximum strength!

Test after test in actual service proves the superiority of Wrap-DRI'S "Controlled Pattern" reinforcing over other methods. In transit or in storage, you'll find Wrap-DRI protects better — is more economical to use.

#### SPECIAL FEATURES INSURE BETTER PROTECTION —

(1) Both outer kraft sheets are asphalt coated to eliminate voids and provide double insurance against moisture transmission. (2) Wrap-DRI comes in extremely wide widths — greatly reducing number of lapped joints on large jobs. (3) Closely woven "controlled pattern" fibre reinforcement, bonded in asphalt, increases tear and puncture resistance.

**VARIOUS GRADES AVAILABLE** — Wrap-DRI is supplied in MEDIUM, HEAVY, and SUPER GRADES — 50, 60 and 63 lb. per M square ft. Or, can be "tailor made" to fit your specific needs. All grades are also supplied Machine Creped for elasticized strength and greater flexibility.

**PRINT DECORATED TOO!** — Wrap-DRI can be imprinted for product identification and effective advertising, for only a few pennies more.

Let Thilco paper "imagineering" help you — Send us complete information regarding your packaging problems. We'll gladly send suggestions and sample grades that solved similar problems for others and should work to advantage for you.



# THILCO

*Functional Papers FOR PROTECTION THAT COUNTS!*

NEW YORK • CHICAGO

CINCINNATI

Detroit • MINNEAPOLIS

Circle No. 142 on Reader Service Card for more information

THILMANY PULP & PAPER COMPANY

KAUKAUNA - WISCONSIN

## PRODUCT SAFETY

*Continued*

the parts in wirebound boxes completely filled with wood shavings. This has prevented the heavy and valuable parts from shifting and damaging each other.

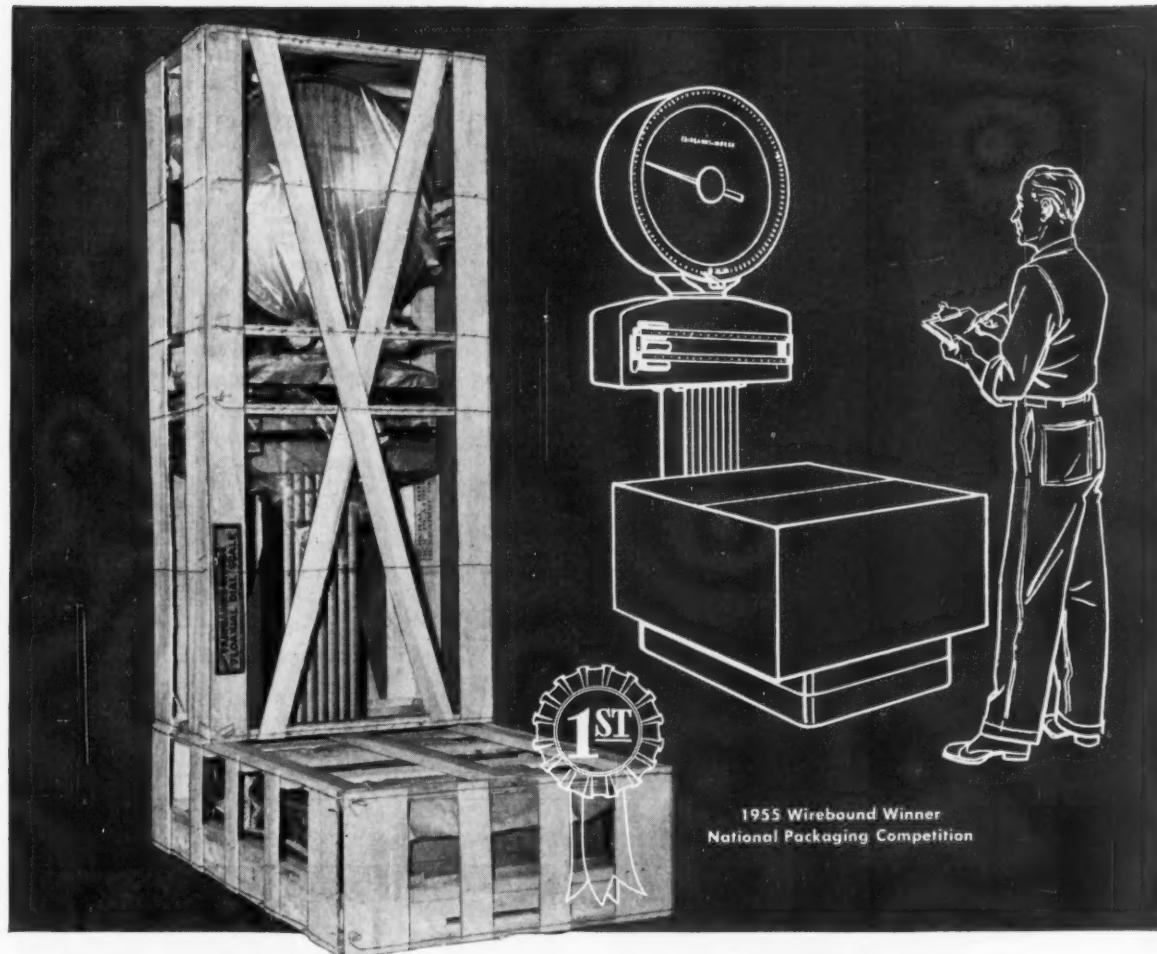
The problem of shipping a giant load safely was solved by The Colonial Iron Works through the use of specially-designed saddles for flat cars and the use of two-inch flat steel strapping. The company, a leading manufacturer of process equipment for chemical and allied industries, faced the problem of shipping 15,000-pound tanks which would roll off flat cars unless properly anchored. The tanks measure 11' 6" in diameter and 25' in height.

For shipment, a tank is lowered onto the special steel saddles by an overhead bridge crane which serves the yard and rail spur. Straps are tensioned around the tank in a manner which holds it snuggly and prevents movement. Demountable legs of the tank are strapped to the floor of the flat car for quick and easy installation.

Two-way safety was designed into a corrugated container used by Lincoln Engineering Co., St. Louis, for its new Multi-Luber Automatic Lubricating Equipment. Firm support to prevent damage to moving parts and secure packing to avoid tangling of lubricant feed lines and electrical wiring are provided by a box using two interior packing pieces.

The preceding examples (and others in illustrations accompanying this article) are of successful attempts to provide safety for products while they are being handled about the plant, while they are in storage and while they are in transit. That too few such attempts are being made in American industry is indicated by the still rising costs of damages to merchandise. Not until all companies recognize the vital importance of product safety will the unhealthy trend be reversed.

*For information and photographs used in the preceding article, Flow's thanks to: Colonial Iron Works Co.; Douglas Aircraft Co., Inc.; Jerome F. Gould Corp.; Hinde & Dauch Paper Co.; Wirebound Box Mfrs. Assn.*



## General engineered wirebounds cut scale packing time 50%, cut setup time 80%

Where it used to take about four hours to assemble, check, and reseal a scale after shipment, it can now be uncrated and adjusted in less than 45 minutes. This is one of the major advantages reported by Fairbanks-Morse after tests and more than a year of experience with wirebounds designed in cooperation with General container engineers.

Other advantages include the reduction of packing time by half and elimination of losses from glass breakage, paint abrasion and other damage. In addition, Fairbanks-Morse is shipping 42 different models of dial scales using only two different block sets and six different wirebound crates.

The complete package includes special blocking to protect delicate mechanisms, and a polyethylene cover to

keep out dust and moisture. These weighing machines in their L-shaped crates passed all requirements of the standard National Safe Transit test series.

The design laboratories of General Box can probably help you make significant reductions in your packing and shipping costs. It's easy to find out. Just let us send a man. And we'll be glad to send the free illustrated booklet, "General Box."

Factories: Cincinnati; Denville, N.J.; East St. Louis; Detroit; Kansas City; Louisville; Milwaukee; Sheboygan; Winchendon, Mass.; General Box Company of Mississippi, Meridian, Miss.; Continental Box Company, Inc., Houston.

# General Box

1847 Miner Street, Des Plaines, Illinois



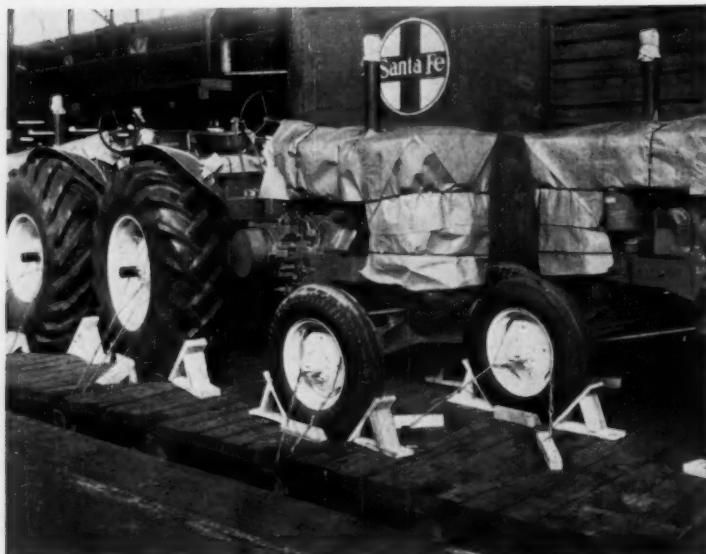
**Engineered Containers for Every Shipping Need**

Wirebound Crates and Boxes • Generalift Pallet Boxes • Corrugated Fiber Boxes • Cleated Corrugated and Watkins-Type Boxes • Stitched Panel Crates • All-bound Boxes

Circle No. 63 on Reader Service Card for more information

DECEMBER, 1955

# Tractor "Bag" Fights Abrasion



**J**OHN DEERE Waterloo Tractor Works solves the problem of abrasion damage to tractors during transit with a fitted cover strapped around vital engine areas. The cover prevents abrasive particles of dust from marring finished surfaces during shipment and storage. Paper used was custom designed to meet the specifications of the Deere Co. and consists of two sheets of kraft, laminated for a high-degree of waterproofness and reinforced with glass fibres. One side of the sheet is specially treated to eliminate friction and consequent abrasion damage.

Courtesy Cromwell Paper Co.

**STEN-C-LABL USERS** Save time and costly shipping errors!

**CASE No. 1**

**Multiple shipments addressed by teletype with STEN-C-LABLs**

Addressing multiple shipments in the Williams Hardware warehouse in Minneapolis is done by a teletype operator in an office ten miles away. While the teletype operator is typing the invoices in the general office, shipping copies and STEN-C-LABLs are addressed on the teletype in the warehouse.

With the STEN-C-LABL applicator, unlimited impressions are then made direct to PANL-LABL on carton or to gummed labels. Addressing errors, mis-shipments are eliminated.

*Find out how your shipping costs can be reduced by the use of STEN-C-LABLs in your operation.*

FREE brochure available on request.

**STEN-C-LABL, INC.**  
2285 UNIVERSITY AVENUE • ST. PAUL 14, MINNESOTA

Circle 164 on Reader Service Card for more information  
120

**Tunnels for Safety**

**DAZZO DOCK SHELTERS**

Provides a foldable tunnelled passageway between building door and truck or freight car door.

Protects your loading dock loaders and merchandise against rain, sleet, snow or driving winds.

Eliminates accidents and loss of traction, due to wet and slippery conditions.

Protects against changes in temperatures when doors are opened for loading.

**DAZZO PORTABLE FREIGHT CAR DOOR RAIN GUTTERS**

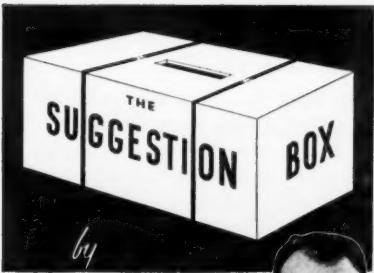
Prevents rain or melting snow from sliding off car roof onto door opening, thereby avoiding wet and slippery dock boards.

Models for all types of cars

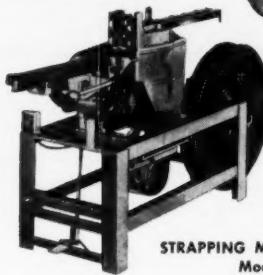
Write for literature... specify your requirements to Dept. F

**DAZZO PRODUCTS CO.**  
152 Bleeker Street • New York 12, N.Y.  
\*Pat. Pend.

Circle 41 on Reader Service Card for more information  
FLOW

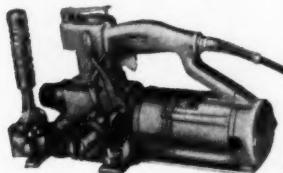


**STANLEY**  
THE STEEL STRAPPING  
SPECIALIST



POWER  
STRAPPING MACHINE  
Model SPS-2

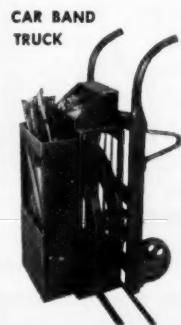
**There's POWER in packing today** — from production line to shipping point! For manufacturers who must maintain high production line speeds to handle volume production, I recommend STANLEY POWER STRAPPING MACHINES to provide the packaging power. MODEL SPS-2 (for use with bundles of lumber, cartons, boxes, crates, etc.) and MODEL SPS-1 (for use with wire coils and strip-steel coils) will do the packing job efficiently and economically.



ELECTRIC  
CAR BANDING TOOL  
WITH BUILT-IN SHEAR

Packing POWER is just as important at shipping point as on the production line. If you ship by rail, car band your carload shipments to prevent product damage and pilferage. Let the sensational new STANLEY ELECTRIC CAR BANDING TOOL supply the power. A built-in shear (with automatic handle return) saves the cost of an extra shearing tool.

It's POWER that puts the speed in your packing, but using steel strapping accessories that cut down — or speed up — the time-consuming movements necessary is important, too. Among these time-saving accessories are STANLEY REEL STANDS, CAR BANDING TRUCKS, CONVEYOR UNITS, COIL HOLDERS and EXTENSION STRAPPING FRAMES.



(Coil Holder furnished separately)

Here's **POWER** to speed up your packing



At the Flintkote Co., Lockport, New York, a switch in binding material (from wire to Stanley Steel Strapping) and method saves both time and money. Operators stand on high platforms where they easily, quickly and automatically steel strap automotive insulation material to pallets. One band around each end secures a bundle for safe shipment. And, with each operator using a Stanley Electric Skid Magazine Tool, strapping time is cut in half. Note, too, the out-of-the-way Stanley Overhead Reels suspended from the ceiling and the use of Stanley Corner Protectors.

## STANLEY

## ELECTRIC

### SKID MAGAZINE TOOL

The answer to faster cost-cutting packaging procedures is . . . POWER! Put POWER in your packing. Use the STANLEY ELECTRIC SKID MAGAZINE TOOL to steel strap your product to skids or pallets. The operator simply squeezes a trigger. The tool's powerful electric motor tightens the strapping to the desired pre-set tension. Easy to use horizontally or vertically on high or low skids or pallets, the Electric Skid Magazine Tool with Automatic Seal Feed lowers labor costs and ups packing output — automatically.

Stanley has the right tool — hand or power — to meet your needs whatever your product or the type of package you use to ship it. Call in the Stanley Steel Strapping Specialist for an on-the-spot demonstration, and mail coupon for free catalog.



INSURE IT — SECURE IT WITH STANLEY STEEL STRAPPING

### STEEL STRAPPING DIVISION THE STANLEY WORKS

STANLEY STEEL STRAPPING DIVISION, 08D-S LAKE ST., NEW BRITAIN, CONN.

Telephone: BALDWIN 9-2021

Please send Catalog SS-9C

Please have Representative call

NAME _____	POSITION _____
COMPANY _____	ADDRESS _____
CITY _____	ZONE _____ STATE _____

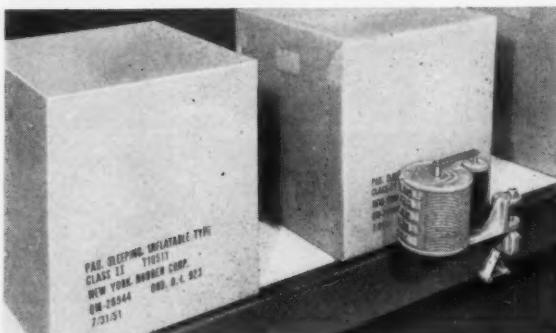


STANLEY TOOLS • STANLEY HARDWARE • STANLEY ELECTRIC TOOLS  
STANLEY STEEL STRAPPING • STANLEY STEEL

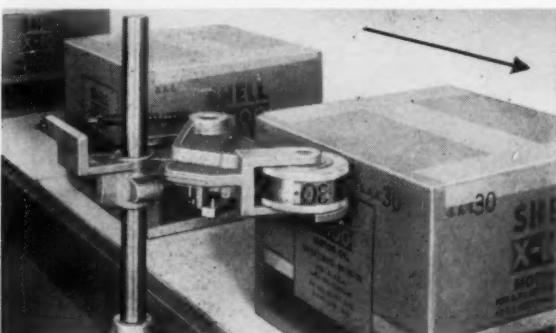
Circle No. 133 on Reader Service Card for more information

# Low-cost marking attachments save thousands of \$ every year

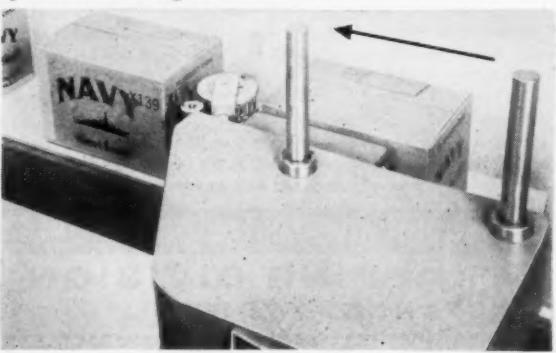
Compact ROLACODER machines  
mark 1, 2 or 4 sides of cartons, cases,  
drums, bags, etc. automatically



Friction-operated ROLACODER "100" machine makes single accurate "spot" imprint of brand names, varieties, code-dates, lot numbers on one side of containers as they travel on conveyors or through case-sealer. Prints from 1 to 5 lines of copy up to 12" long from easily interchangeable rubber type.



Twin-action ROLACODER "500" marker marks codes and lot numbers on front and one side panel of cases simultaneously... in a single pass. Friction-operated... imprints legends containing up to 8 letters and figures.



Solenoid-activated twin-action ROLACODER "200" machine imprints codes and lot numbers on rear and one side panel (or rear only). When mounted in tandem with ROLACODER "500" machine, cases can be marked on all 4 sides simultaneously without requiring that they be turned.

Write for new Bulletin "ROL-2"



**ADOLPH GOTTSCHO, INC.**  
Dept. D, Hillside 5, N.J.

In Canada: RICHARDSON AGENCIES, LTD., Toronto & Montreal

Circle No. 72 on Reader Service Card for more information  
122

Automatic  
CODING, MARKING,  
IMPRINTING  
MACHINES

## SAFETY IN THE FOUNDRY . . .

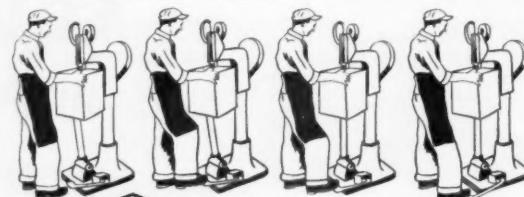
(Continued from page 87)

to remove the casting from the mold eliminates the bending over to pick up the castings from the floor.

A process peculiar to the manufacture of malleable castings is the packing of castings for the annealing operation. Automatic positioning devices have been installed in many small foundries. In these the stacks of containers for the castings are always maintained at waist level for a comfortable work level. Coupled with this is the gravel reconditioner, in which the castings are mechanically dumped on a waist high vibrating screen, and the loose material is mechanically screened and put into an overhead storage tank for reuse in the packing operation.

Occasionally, human failures cause unforeseen difficulties. Such was the case at one plant where a hoist was overloaded. It broke loose, fell on the ladle, and iron spilled through a grating onto a spill-sand belt. As the belt traveled along, burning, it ignited air hoses. When they burned through, air pressure caused them to whip around, upsetting a can of pattern spray, which caught fire. While the damage was not great, it did delay production—and engineers immediately determined safety measures to prevent re-occurrence.

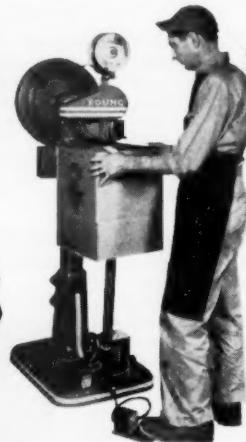
One was an extra safety pin which would hold the hoist to the trolley carriage if the first pin should shear. The second consisted of two lengths of cable, one on each end of the carriage. These permit the carriage to turn, but if one end of it should snap loose, the retaining cable will hold it.



Compare  
**WIRE STITCHING  
THIS FOUR STEP  
FATIGUING WAY**

WITH THE EASE OF  
STITCHING WITH A  
**Young Conqueror**  
Wire Stitcher  
YOUR FOOT NEVER  
LEAVES THE FLOOR !

BECAUSE THE  
**ELECTRICALLY  
ACTUATED POST**  
DOES THE WORK !



The Stitcher With The Plus Features

**DIAGRAPH-BRADLEY INDUSTRIES Inc.**  
P. O. BOX 269 HERRIN, ILLINOIS  
DISTRIBUTORS IN ALL PRINCIPAL CITIES



Circle No. 46 on Reader Service Card for more information  
FLOW

**HUMAN ENERGY**

(Continued from page 73)

**C. Energy involved in 60(2 x 30) accelerations:**

$$60 \times .05 = 30 \text{ Calories}$$

Total amount of energy expenditure during one hour ( $A + B + C$ )

$$224 + 93 + 30 = 347 \text{ Calories}$$

This is 97 Calories over the recommended 250 Calories per hour, and the trucker is, therefore, exceeding the recommended safe limits. The problem is to determine the engineering approach to decrease energy expenditure to within the limits of 250 Calories per hour.

We first focus our attention on Graph No. 2, and we find that the recommended limits allow a trucker to keep a truck of 800 pounds in motion on a floor with a friction coefficient of .04. (This observation is independent of the previous energy calculation and indicates only that the required force for keeping the truck in motion is 32 pounds). We see on the same graph that one man should not be required to start to move this truck because about 57 pounds is necessary for the acceleration of one foot per second.

**Conclusion:**

The condition under discussion is undesirable for two reasons:

1. The total amount of energy required per hour exceeds the recommended 250 Calories.
2. The horizontal resistance during the acceleration exceeds the recommended 50 pounds.

**Solutions:**

It is obvious that the first step is to improve the floor conditions. A rolling friction coefficient of .02 makes it possible for one trucker to start this load in motion (See Graph No. 2). The calculations of energy consumptions are now as follows:

**A. Energy involved in keeping the loaded truck in motion:**

$$R = .02(150 + 650) = 16 \text{ pounds}$$

$$E = 7 \times 30 \times 200(150 + 12 \times 16) = 143.64 \text{ Calories}$$

$$10^5$$

**B. Energy involved in keeping the empty truck in motion:**

$$R = .02 \times 150 = 3 \text{ pounds}$$

$$E = 7 \times 30 \times 200(150 + 36) = 78.12 \text{ Calories}$$

$$10^5$$

**C. Energy involved in 60 (or 2x30) accelerations at .05 = 30 Calories:**

Total amount of energy involved during one hour

$$(A + B + C)$$

$$144 + 78 + 30 = 252$$

This amount of energy expenditure is now close to the 250 calories, and the gain of 95 Calories per hour is a result of the improvement in floor conditions.

**WHERE ARE THE LABELS?**

If you like labels for addressing containers, but would like to cut the time and labor it takes to address and apply them—here's a good idea. You can print facsimile labels directly on cartons with a Weber handprinter and Kustom Kut Stencil. Stencils are die-cut with facsimile of your label. All you do is type in ship-to address and attach to printer. Good for product identification marking too. Fast, neat, systematic and inexpensive. Write for full details on the Weber Facsimile Label System.

**Weber**

Weber Marking Systems  
Dept. 1-L  
Div. of Weber Addressing Machine Co.,  
Mount Prospect, Illinois

PAK-RAPID equipment  
eliminates old-fashioned,  
manual packaging operations.

**DO YOU**

1. Buy prefab bags?
2. Inventory them in your warehouse?
3. Print them at added cost?
4. Deliver them to the operation?
5. Open them by hand?
6. Hand fill them?
7. Seal them by hand?
8. Count them by hand?

ONE PAK-RAPID MACHINE ELIMINATES THESE OLD-FASHIONED METHODS, DOES THESE JOBS AUTOMATICALLY IN A ONCE THROUGH OPERATION.

In addition, it gives you: versatility-efficiency-economy-simplicity. Get full details and new literature from your PAK-RAPID representative or, write us direct.

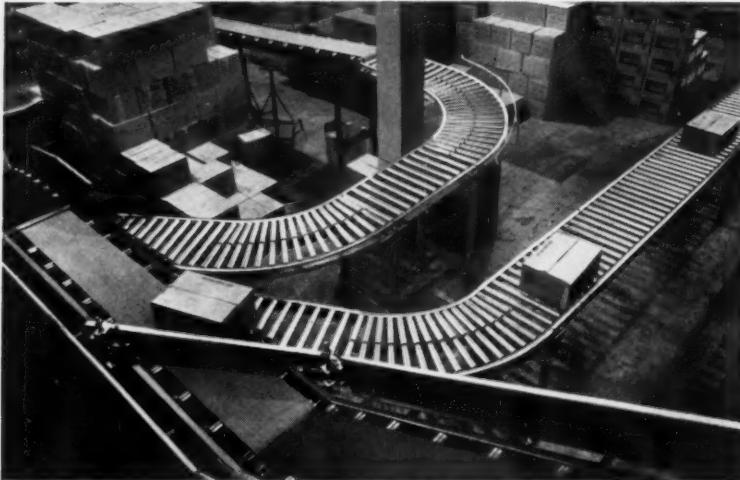
**PAK-RAPID INC.**

Incorporated 1945

Builders of Fine Packaging Machines  
530 N. 21st Street Philadelphia 30, Pa.

# Ask Standard

*how to cut costs with conveyors*



Order picking is expedited and simplified by this Standard system of roller and belt conveyors in large warehouse.

## Roller and belt conveyors ease warehouse traffic jams

FAST flow of goods and simplified labor add up to more profitable warehouse operations.

Standard offers a wide variety of gravity and powered, permanent and portable conveyors — that can help you establish smooth, more profitable warehousing.

Spend a few moments with a Standard engineer. He'll show you how in-

expensive Standard conveyors give you maximum flexibility at minimum cost. He'll show you, too, how Standard conveyors provide the many advantages of a custom-designed system at low cost. For the name of your nearby Standard engineer write STANDARD CONVEYOR COMPANY, General Offices: North St. Paul 9, Minn. Sales and Service in Principal Cities.



(LEFT) Belt-booster in a gravity roller conveyor "order picking" line. (RIGHT) Lift or lower floor-to-floor with an INCLINEBELT. Available in a wide range of heights and belt widths.



Write for Bulletin 309-CP. Better still, contact the Standard engineer listed in your classified phone book.



Circle No. 132 on Reader Service Card for more information

## HUMAN ENERGY

*Continued*

Several other solutions may be obtained to reduce the calorie consumption—one can reduce the number of trips per hour, reduce the weight of the truck or load, or make this operation a two-man job if necessary.

### Operations on Ramps

A ramp increases horizontal resistance of a truck, depending upon the angle of the ramp (slope), friction coefficient of the ramp surface, etc. Maximum allowable resistance of a truck on a short ramp is 50 pounds. This value is the same as the recommended resistance during the start of the truck on a level surface, because this force is applied, in both cases, during a short time.

If we know the weight of the truck and its load, the friction coefficient of the ramp surface, and the angle of the ramp, we can calculate the pushing resistance of the truck on the ramp. Graph No. 3 enables us to judge whether a specific ramp situation is satisfactory or not. It also informs us about the possibilities of improving an unfavorable condition.

### For Example:

The vertical ordinate gives the angle of the ramp in degrees. The maximum weight of truck and load is plotted horizontally. This maximum weight is based upon the maximum allowable resistance of 50 pounds.

If the angle of the slope and the friction coefficient of the ramp surface are known, one can find its crosspoint on the graph. By going down from the crosspoint we will find the maximum allowable weight of truck and load.

### For Example:

Angle of Ramp	Friction Coefficient	Maximum Weight Approx.
8°	0.02	315 lbs.
4°	0.06	390 lbs.
4°	0.03	500 lbs.
2°	0.02	900 lbs.

One can also use this graph for the calculation of the allowable slope of the ramp if the weight of the truck and its load are known.

**Slopes of 6 degrees or over never allow a trucker to push any weight over 400 lbs., and are, therefore, not practical.**

We like to emphasize the importance of the surface condition of the ramp. A poor floor with a rolling friction coefficient of .05 on a ramp of 2 degree slope allows a maximum truck weight of 600 lbs. The same ramp with a smoother floor surface (rolling friction coefficient .02) makes it possible to increase the total weight to 900 pounds—a gain of 300 pounds.

#### **Conclusions:**

1. The maximum allowable pushing resistance on a short ramp is 50 pounds.
2. The maximum slope of a ramp is approximately 6 degrees for manual trucking.
3. Pushing a truck up a ramp is recommended over pulling.
4. The best average height of the horizontal pushing bar of a hand truck is approximately 30 to 40 inches above the floor level.

#### **Practical Applications:**

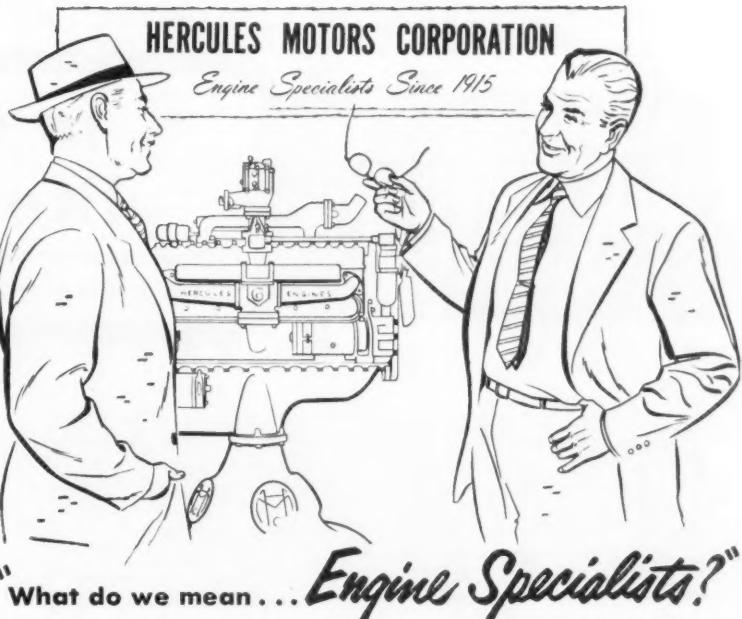
A plant has a ramp of 6 degree slope. The truck weight is approximately 120 pounds. The rolling friction coefficient of the ramp surface is estimated at 0.05, and most of the loads are approximately 500 pounds. Is this situation tolerable, and if not, how can it be improved?

We find in Graph No. 3 that, for a ramp slope of 6 degrees and a rolling friction coefficient of 0.05, a maximum weight of truck plus load of approximately 330 pounds is allowable. The total weight of truck and load is, however, 620 pounds—almost 100 percent over the maximum weight.

To decrease the pushing resistance, one can decrease:

1. The slope of the ramp.
2. The rolling friction coefficient of the ramp surface.
3. The weight of the empty truck.
4. The weight of the load.

Other solutions are obviously possible—as in the use of lifts, leverers, power equipment, and two or more men.



Briefly, it means that Hercules manufactures engines to meet the customer's requirements. These engines are produced by modern methods and each engine is tailored to fit the equipment which it will power.

The wide selection of engine sizes in the Hercules line, plus the flexibility of our production facilities enable us to specialize in building engines to meet the customers needs. We have over 90 different basic engine models, ranging from 3 to 500 H.P., available for operation on gasoline, diesel fuel, L.P.G., natural gas and kerosene.

Further, it is our policy to work with customers and to help them select the type of engine best suited for their equipment. We do more than merely suggest the use of a standard type engine. Hercules engineers work with the product engineers to select an engine with accessories and other engine components modified or positioned to fit the requirements of the end product. After these engineering problems are solved and the test engine has proved itself, our production of these engines is scheduled to meet your delivery requirements.

*Whether your engine requirements are for 1 or 1001, specify Hercules Engines, the product of Engine Specialists Since 1915.*



**HERCULES ENGINES**  
HERCULES MOTORS CORPORATION

*40 Years of Engines for Industry*

113 Eleventh Street, S. E. • Canton, Ohio  
Circle No. 76 on Reader Service Card for more information



## in useful literature

These publications, written by experts, are available. Indicate your choice on the self-mailing Readers Service Card.

### Three-in-One Unit:

Kwik-Mix Company has published an eight page catalog which graphically covers the Moto-Bug, said to be a "3 tools in one" low cost material handling unit. The literature points out how three easily interchanged attachments enable the unit to load, lift or haul all types of material.

**Write 171 on Reader Service Card**

### Fact Folder:

Four page folders designed for easy readability and to provide facts at your fingertips on any specific series of Towmotor fork trucks and tractors are available from Towmotor Corporation.

**Write 172 on Reader Service Card**

### Answers Bulk Problems:

What is said to be the most practical answer to bulk material handling problems ever developed is outlined in literature from Tote Systems, Inc.

**Write 173 on Reader Service Card**

### Hauls, Switches, Spots:

Bulletin T-115 from Whiting Corporation gives details on the new heavy-duty Trackmobile that hauls, switches and spots. The unit is said to be powerful, versatile and low cost.

**Write 174 on Reader Service Card**

### Magnesium Stair Climber:

Milwaukee Truck Company describes the magnesium hand truck with built-in stair climbers in a single sheet.

**Write 175 on Reader Service Card**

### Floor-to-Floor Transportation:

Leaflet from Florlift Corporation describes a new unit that automatically transfers goods from floor-to-floor at the touch of a button. It is said to pay for itself within the first year.

**Write 176 on Reader Service Card**

### Plastic Sheeting Manual:

Advantages, applications and procedures for using Scotchply brand reinforced plastic are described in a 20 page reference manual offered by Minnesota Mining and Manufacturing Co.

**Write 178 on Reader Service Card**

### For Clamshell Bucket Operators:

Practical help for clamshell bucket operators is graphically presented in a comprehensive bulletin published by Blaw-Knox Company.

**Write 179 on Reader Service Card**

### Lumber Packaging Film:

"Packaging of Lumber for Shipping and Storage" is the theme of a new film produced by the American Sisal-kraft Corp. The film deals with the various methods employed by lumber mills, wholesalers and dealers in cutting costs in shipping and storing lumber.

**Write 180 on Reader Service Card**

### Magnetic Counters:

Veeder-Root, Inc. has published a four-page brochure on magnetic counters developed for counting objects that present difficulties because of their size, weight, composition or condition.

**Write 181 on Reader Service Card**

### Storage Tank Venting Fundamentals:

Principles of venting flammable liquid storage and process tanks for effective operation, fire protection and low-cost maintenance are described in a booklet available from Protecto-seal Co.

**Write 182 on Reader Service Card**

### Coding and Marking Equipment:

News about the Autoprinter, a machine that dates, marks or codes multi-wall bags and containers as you need them, is offered in pamphlet-form by Industrial Marking Equipment Co., Inc.

**Write 183 on Reader Service Card**

### Absorbs Shock:

B. F. Goodrich Company tells about Texlite rubberized hair and/or wool that absorbs shock, providing safe packaging for anything to be shipped anywhere, in literature just off press.

**Write 184 on Reader Service Card**

### Ways to Cut Costs:

Literature from Pittsburgh Steel Company lists numerous ways to cut material handling costs with new Duty-Designed Cargotainers. Dollar and cents savings and descriptions of how the containers speed handling and lower operating costs are outlined.

**Write 185 on Reader Service Card**

### Hydraulic Power Steering:

A two-page bulletin from Vickers Inc. describes the new Series S22 power steering booster for smaller vehicles.

**Write 186 on Reader Service Card**

### Automatic Checkweight Scale:

Catalog available from Weighing Components, Inc. describes a completely automatic weight printer and totalizer designed for rapid and efficient checkweighing of bags, drums, cartons.

**Write 187 on Reader Service Card**

### Cost-Saving Techniques:

Studies of cost-saving handling techniques in ten industries are contained in the latest issue of Material Handling News published by Clark Equipment Company's Industrial Truck Div.

**Write 188 on Reader Service Card**

### Elevator Accident Report:

The need for adequate safety codes and their strict enforcement are emphasized in a report on vertical transportation accidents released by Otis Elevator Company. The report shows that two-thirds of all elevator accidents reported from 1951-1953 applied to cars 20 or more years old.

**Write 189 on Reader Service Card**

### **Conveyor News:**

News on a variety of conveyor installations designed to speed operations and save money is contained in the *Rapid Handler*, publication of The Rapids-Standard Co., Inc.

**Write 190 on Reader Service Card**

### **Application Ideas:**

Air tool application ideas to save time and money for production men are suggested in literature released by Keller Tool Division of Gardner-Denver Company.

**Write 191 on Reader Service Card**

### **Automatic Feeders:**

How to get increased production with automatic feeders is described in literature available from Feedall Incorporated.

**Write 192 on Reader Service Card**

### **Safety Film:**

A new and dramatic highway safety film "The Last Mile" has been released by Caterpillar Tractor Co. The film points out dangers involved in turning an old overcrowded road into a safe modern highway.

**Write 193 on Reader Service Card**

### **Short Turning Truck:**

If you have long stock you'd like to turn in a short radius, literature from Wenthé Davidson Engineering Company suggests a simple solution.

**Write 194 on Reader Service Card**

### **Electric Walkie:**

Detailed in literature offered by Lewis-Shepard Products, Inc. is the new short-coupled Jacklift electric walkie truck, said to be the shortest of its type on the market.

**Write 195 on Reader Service Card**

### **Speedier Loading:**

Dock levelers designed to speed loading and unloading are pictured and described in literature available from The Wayne Pump Company.

**Write 196 on Reader Service Card**

### **Simplified Dock Loading:**

Solutions to 13 difficult dock loading and yard loading problems are outlined in a four page folder released by Magnesium Company of America. In each of the cases a line drawing is used to illustrate the problem and an actual photo shows how the problem was solved.

**Write 197 on Reader Service Card**

### **Safety Electrification:**

Low cost Insul-8-Bar system for the safety electrification of cranes and monorails are described in an eight page catalog available from American Monorail Company.

**Write 198 on Reader Service Card**

### **Vacuum Lifter:**

An 8-cup roll-over vacuum sheet lifter that lifts sheets up to five feet wide by 20 feet long is illustrated and described in a single sheet release by F. J. Littell Machine Co.

**Write 199 on Reader Service Card**

### **Safety in The Mine:**

An efficient audio system that can be used to transmit repeated safety reports, instructions, etc. is described in a bulletin issued by Mine Safety Appliances Company.

**Write 200 on Reader Service Card**

### **Fast Dumping:**

Bulletin from The Heil Company points out advantages of the 10-16 ton capacity twin arm hoist, said to offer less maintenance and faster dumping.

**Write 201 on Reader Service Card**



Model PO-40S-Telescopic

## **Store high and save space with BARRETT HI-LIFTS**

Barrett "walkie-type" PowerOx Hi-Lift trucks are built for floor-to-ceiling storage that conserves space. Available for either platform or pallet handling. Short turning radius for narrow aisle operation. Priced within your budget — low maintenance cost.

• Platform Model PO-40...cap. 4000 to 6000 lb. Travel speed 2½ m.p.h. Over-all height 82"—platform elevation 72". Other lifts and telescopic model shown above available. Write for BULLETIN 551-3.

• Fork-type Model TTF-20...cap. 2000 to 3000 lb. Travel speed 2½ m.p.h. Over-all height 68" or 83". Fork elevation 91¼" or 121¼". Single mast or telescopic models. Write for BULLETIN 551-2.

**BARRETT-CRAVENS COMPANY**  
**614 Dundee Road, Northbrook, Ill.**

Representatives in All Principal Cities.  
Canadian Licensee: S. A. Armstrong, Ltd., Toronto, Canada

**BARRETT**  
SPEED UP YOUR HANDLING...WITH POWEROX

Circle No. 28 on Reader Service Card for more information



JUST OFF THE PRESS: Bulletins 551-1-2-3 Barrett's complete line of "walkie-type" PowerOx Trucks. Send for your copy.

**New Power:**

Clark Equipment Company pictures and describes new power features of the Powrworker electric walkie in a colorful folder just off the press. The trucks are shown working in nine prominent companies, handling a variety of items.

**Write 202 on Reader Service Card**

**Modern Truck Crane:**

Catalog 700G-28 from American Hoist and Derrick Company tells how a modern truck crane handles the biggest lifts with ease.

**Write 203 on Reader Service Card**

**Tow Trucks:**

Towliner trucks in standard and special designs are depicted in a colorful brochure available from Towsley Trucks Inc. The literature contains actual photos and specifications.

**Write 204 on Reader Service Card**

**Traveling Cranes:**

Catalog 62 published by Reading Crane & Hoist Corporation contains numerous photos of motor driven traveling cranes. Detailed specifications and characteristics of the cranes are included in the publication.

**Write 205 on Reader Service Card**

**News About Magnesium:**

Brooks & Perkins Incorporated reports interesting facts about magnesium and its use in a recent issue of Magnesium. The design of magnesium air-borne packages is discussed in detail, and a new method of brazing is outlined.

**Write 206 on Reader Service Card**

**Spots Tramp Metal:**

The quality of your product is protected with its metal detector, says literature from Radio Corporation of America which tells how the unit works.

**Write 207 on Reader Service Card**

**General Purpose Scales:**

A single sheet release from The Exact Weight Scale Company gives pictures and specifications on general purpose scales, available in eight different models for packaging, checkweighing and batching.

**Write 208 on Reader Service Card**

**Heavy-Duty Fork Truck:**

Plus values of its 8000 pound capacity electric fork truck are pointed out in a four page release by Elwell-Parker Electric Company. The E-P design is said to insure low cost, dependable material handling.

**Write 209 on Reader Service Card**

**Storage Battery Helps:**

Gould-National Batteries, Inc. has available helps on storage battery selection, charging, handling, maintenance, inspection and testing. The information is offered as part of the Plus-Performance Plan.

**Write 210 on Reader Service Card**

**Splicing Problem?**

If you have a wire rope splicing problem, leaflet from Jones & Laughlin Steel Corporation offers details on how you can obtain slings with unsurpassed resistance to distortion.

**Write 211 on Reader Service Card**

**Case Studies Tell How:**

Twenty-five folders which describe case studies of equipment in action are contained in a handy packet offered by Lewis-Shepard Products, Inc. The folders contain solutions to a variety of problems and suggest many ways to cut handling costs.

**Write 212 on Reader Service Card**

**Magnetic Pulleys:**

Detailed specifications on magnetic pulleys and pulley separators are contained in bulletin 303-C issued by Stearns Magnetic, Inc.

**Write 213 on Reader Service Card**

## Assure constant material flow from your bins and hoppers with . . .

**DEPENDABLE** **SAFE** **ECONOMICAL** **QUIET**

**PneuBin**  
Pulsating Panels

**PneuBin** is a new concept in material flow engineering. The **PneuBin** unit consists of steel-backed, neoprene, pulsating panels, strategically located on the inside walls of your present bins. Working off the plant's regular air supply, **PneuBin** is inflated and deflated in controlled cycles, causing the contents of the bin to be "positively displaced" and thus assures free flow of material through the discharge opening.

**DEPENDABLE**—**PneuBin** is on the job whatever the material flow problem. **PneuBin**'s principle of "positive displacement" moves the bin contents, not the bin . . . assures constant, free-running material discharge. Depend on **PneuBin** to insure material flow.

**SAFE**—No manpower is needed to facilitate material flow from bins when **PneuBin** is on the job. No more prodding, poking or sledge-hammering. Depend on **PneuBin** to insure material flow . . . safely.

Send for "Flow Stoppage" and free literature. **PneuBin** engineers will gladly make recommendations with no obligation on your part.

**ECONOMICAL**—**PneuBin** cuts maintenance costs, saves money year after year. Reduce bin damage . . . increase bin life. Depend on **PneuBin** to insure material flow . . . safely, economically.

**QUIET**—**PneuBin** pulsating panels breathe . . . not snore. No hammering or loud vibration noises. **PneuBin**'s quiet operation adds to overall plant efficiency . . . reduces employee fatigue. Depend on **PneuBin** to insure material flow . . . safely, economically, quietly.



Circle No. 65 on Reader Service Card for more information

### **Truck Selection Guide:**

Hyster Company has available an industrial equipment analysis guide and rating table which tells how to compare and select fork trucks. Called "How to Select a Lift Truck", the guide lists 36 truck features which should be analyzed.

**Write 214 on Reader Service Card**

### **Evolution of Machine Tools:**

The saga of the evolution of machine tools, starting with the cave men and projecting into the machines of the future, is told in interesting story form by Twin Disc Clutch Company.

**Write 215 on Reader Service Card**

### **Fewer Injuries:**

How one company reduced employee injuries 90 percent is told in Job Study 143 by Towmotor Corporation. The same firm also reduced parts breakage an estimated 60 percent.

**Write 216 on Reader Service Card**

### **Standard and Special Trucks:**

Bulletin 55 from Towsley Trucks, Inc. pictures and describes standard and special use warehouse trucks. Also shown are two-wheel hand trucks, skids and wheels.

**Write 217 on Reader Service Card**

### **Modern Warehousing:**

How a large volume and wide variety of goods is handled by a Cincinnati warehouse in 50 percent less time through use of five fork trucks is told in literature offered by Towmotor Corporation.

**Write 218 on Reader Service Card**

### **Dairy Products Handling:**

Profitable handling of dairy products, poultry, hog and dairy feeds, and chemical fertilizers is discussed in Field Report No. 50 published by Hyster Company.

**Write 219 on Reader Service Card**

### **Where Time Counts:**

For any industry where time counts, Standard Instrument Corporation Division of Heat-Timer Corporation, suggests reading of its bulletin on the Time Recorder-Totalizer.

**Write 220 on Reader Service Card**

### **Drive Selection Booklet:**

Allis-Chalmers Manufacturing Company has available a 74 page booklet containing handy multi-color tables for quick and easy selection of constant speed Texrope V-belt drives.

**Write 221 on Reader Service Card**

### **Switches, Spots Cars:**

How the principle of weight transfer works to switch and spot freight cars is described in literature on the Hemco-Motive published by Hemco Manufacturing, Inc.

**Write 222 on Reader Service Card**

### **Dump Bodies:**

Hercules Steel Products Company is offering a four page catalog describing the firm's complete line of dump bodies, hydraulic hoists, trailer dumps, hydraulic Load-N-Gates and special truck equipment.

**Write 223 on Reader Service Card**

### **Separation Magnets:**

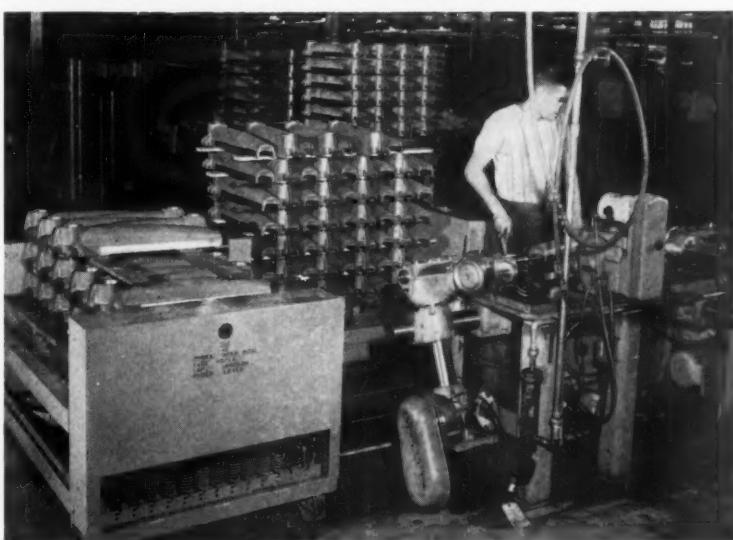
Full details on lifting and separation magnets and magnet control equipment, including performance data, are contained in a four page bulletin published by The Ohio Electric Mfg. Co.

**Write 224 on Reader Service Card**

### **Passenger Elevators:**

The modern passenger elevator is depicted in literature prepared by Rotary Lift Company. Oildraulic Rotary elevators are said to be high in quality and performance, and economical too.

**Write 177 on Reader Service Card**



## **"We maintain a constant and higher rate of production with LOWERATORS..."**

says Edward Forth, Plant Supt., De Walt Inc., Lancaster, Pa.

"Because mobile AMF Lowerator Self-Leveling Work Positioners keep radial arm saw castings always at a constant work level, our multiple drilling machine operators are able to maintain a constant and higher rate of production.

"They don't have to stoop, bend or reach for parts, so they work steadier and are not fatigued at day's end."

Standard or custom-built AMF Lowerator models are available in a wide range of size and weight capacities. Mail coupon below for folder containing complete information.

Another  Product

**LOWERATOR**  
WORK POSITIONER

New York 16, N.Y.

Lowerator Division Room 21 American Machine & Foundry Company 261 Madison Avenue, Room 18, New York 16, N. Y.	
Please send me a copy of your folder, L-131, showing how AMF Lowerators help solve work-positioning problems.	
NAME _____	TITLE _____
COMPANY _____	
ADDRESS _____	
CITY _____	ZONE _____ STATE _____
(Please attach to business letterhead and mail)	



Circle No. 6 on Reader Service Card for more information

### **Trailer Dumps:**

Stability, durability and adaptability of Galion trailer dumps are pointed out in a six page catalog issued by Galion Allsteel Body Company.

**Write 320 on Reader Service Card**

### **Motors and Mushrooms:**

A recent copy of Enginews tells the part Wisconsin engines play in hiking the production of the growing mushroom industry. The release is available from Wisconsin Motor Corporation.

**Write 321 on Reader Service Card**

### **Reduced Costs:**

The reduction of feed production costs is the subject of an eight page reprint of a technical article offered by Fuller Company, subsidiary of General American Transportation Corp.

**Write 322 on Reader Service Card**

### **For Pressure-Sensitive Tapes:**

A complete line of dispensers and taping machines for pressure-sensitive tapes is covered in a 16-page manual prepared by Minnesota Mining and Manufacturing Co.

**Write 324 on Reader Service Card**

### **Pipeline Traps:**

Newly-designed magnetic pipeline traps that assure product purity, reduce damage and maintenance, are depicted in a colorful release available from Eriez Manufacturing Company.

**Write 323 on Reader Service Card**

### **Marking Pen:**

Folder published by Marsh Company lists a number of ways the Marsh 77 felt-point pen can be used to advantage. The pen marks on wood, plastic, cloth, metal, paper, stone and glass.

**Write 325 on Reader Service Card**

### **Casters and Wheels:**

Modern Caster Company has published a 24 page catalog which covers Modern casters and wheels. Photos, drawings and specifications are contained in the literature.

**Write 326 on Reader Service Card**

### **Highly Maneuverable Electric Trucks:**

Fast, highly maneuverable electric fork trucks in capacities of 1500-, 2000-, and 2500-pounds are described in a six-page bulletin recently released by Baker-Raulang Company.

**Write 327 on Reader Service Card**

### **Mobile Radio:**

Motorola, Inc., Communications and Electronics Division, tells about an integrated radio system in a recent issue of its publication, Newsgram. Other interesting two-way radio stories are included in the literature.

**Write 328 on Reader Service Card**

### **Power Crane and Shovel:**

Available from Baldwin-Lima-Hamilton Corporation is bulletin 204 which covers the one-half cubic yard power shovel, 13- to 15-ton capacity crane, called the Jobmaster.

**Write 329 on Reader Service Card**

### **Steel Shelving:**

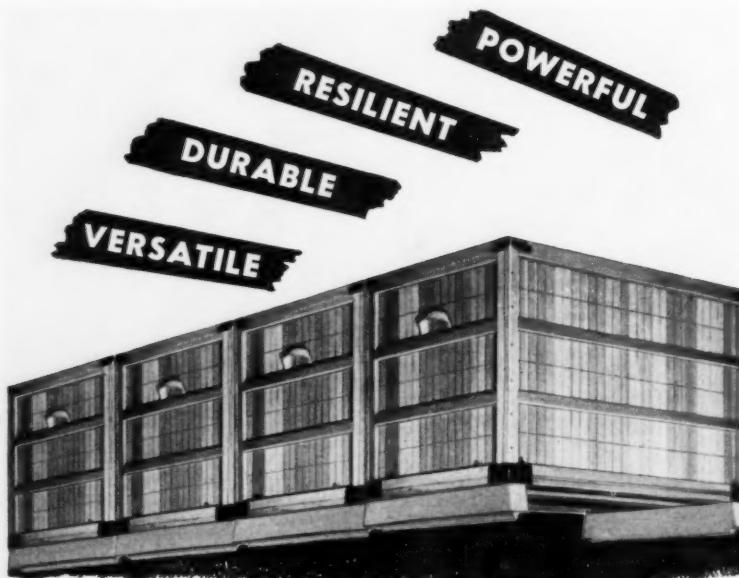
Unitized Flexi Steel shelving is described in a new 32 page catalog published by Burroughs Manufacturing Co. The literature also tells how to plan a steel shelving layout.

**Write 330 on Reader Service Card**

### **Maximum Clamshell Life:**

An eight page folder has been published by Blaw-Knox Company which tells users of overhead traveling bucket cranes how to obtain maximum cable life and top performance from their clamshells.

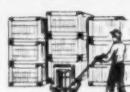
**Write 331 on Reader Service Card**



## **LEWIS Skid Boxes**

The famous box that's been a "bottleneck breaker" in major industries from coast to coast. They stack ceiling high to give that extra storage space and rapid inventory control. These "quiet" skid boxes handle heavy loads with ease, singly or in multiples.

No wonder they can handle the toughest jobs . . . firm, yet resilient, elm slats locked in heavy galvanized steel wire . . . hardwood frame, dovetailed joints, heavy gauge metal corner irons. They're built for day-in, day-out service. Write for folder today.

**SKID BOX****STACKING BOX****BOX TRUCK****LIGHTWEIGHT, EASY HANDLING****BUILT TO "ABSORB" ROUGH TREATMENT****MASONITE TRUCK****COLLAPSIBLE BOX**

**REPRESENTATIVES FROM  
Coast to Coast**

**LEWIS**  
INDUSTRIAL CONTAINERS

**G. B. LEWIS CO. • 6122 Montgomery St. • Watertown, Wisconsin**

Circle No. 95 on Reader Service Card for further information

## SAFETY-EFFICIENCY

(Continued from page 103)

It was clear from these figures that greater efficiency achieved through mechanization had resulted in greater safety. Thereafter, United systematically eliminated manual handling of cargo wherever possible. Portable conveyor belts were introduced soon after. Today, the company has approximately \$40,000 in cargo handling equipment per gate position at major terminals.

United's safety department, headed by Capt. C. M. Christensen, has three divisions—safety education and training, flight safety and ground safety. The divisions provide advisory and co-ordinative service in working with sizable safety groups which are separately organized within the company's operating branches. The latter consist of Flight Operations, Engineering & Maintenance and Transportation Services.

Cargo handling is the responsibility of Transportation Services, which also includes ground services, passenger service and other operational departments. Transportation Services has six area safety engineers to assist station managers and supervisors in anticipating and solving safety problems. Statistics compiled by the safety department pinpoint trouble zones for remedial action.

Several years ago, for example, safety department statistics spotlighted an increase in foot injuries among ramp workers. Investigation disclosed that the accidents were caused by a cargo cart tongue which could flop over when the cart was not in use. With this as a starting point, United developed a new cart that had double the capacity of its predecessors. The tongue of the new cart was designed to lock in an upright position out of the way of hurrying feet and, incidentally, to brake the parked vehicle against rolling. In solving the problem, both efficiency and safety were benefitted.

Looking forward to future introduction of jet planes, United's engineers have recommended the development of pre-loaded containers for most of the cargo. The

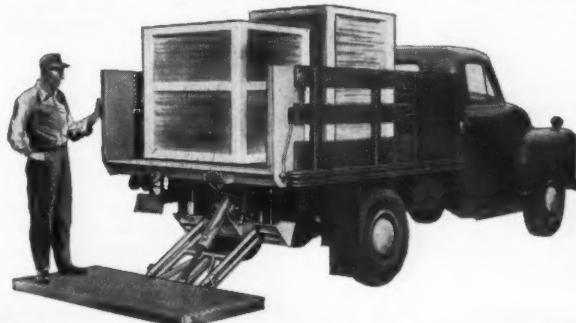
primary purpose is to reduce the time jets will spend on the ground, since each lost minute will be equivalent to almost nine flight miles. By eliminating package-by-package handling, the containers would contribute to safety.

R. D. Kelly, United's superintendent of technical development, believes that some form of docking equipment will be required to handle jets most efficiently. The company already has experimented in this direction with an "Air-dock." A full-scale mockup of this device, which was built and suc-

cessfully tested at Denver some months ago, uses hydraulic lifts to load and unload cargo. Items are carried to and from a central sorting room by conveyor belts which extend along the side of the parked plane. Pre-loaded cargo carts, dispatched from the sorting room, trip off the hydraulic lifts which raise to pit heights.

Ramp traffic accidents would occur less often, since most of the mobile equipment would be eliminated. Here again safety and efficiency would benefit simultaneously.

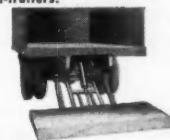
## NOW...WHICH SIZE FITS YOUR DELIVERY NEEDS?



### NEW ANTHONY "LIFT GATE" For $\frac{3}{4}$ -Ton and Larger Trucks



Model No. 146 handles up to 4000 lbs. on heavy trucks and semi-trailers.



Model No. 145 handles up to 2000 lbs. on 1½-Ton and larger trucks and semi-trailers.



Model No. 130 for Pick-up Trucks with steel express bodies.

This new lower priced Anthony Model No. 144 "LIFT GATE" handles loads up to 1000 lb. (other sizes from 800 to 4000 lbs. are available). Lift Gates in all sizes let one man do the work of three or more when loading or unloading a truck with heavy bulky freight—and in one-third the time. Loading and unloading is done with ease by moving one conveniently located lever to control the powerful hydraulic action of the "LIFT GATE". With the time saved in loading and unloading you can double your deliveries. Damage to merchandise and personnel accidents are greatly reduced. One "extra" delivery each day will pay for your Anthony "LIFT GATE". Write today for complete information.



ANTHONY COMPANY  
Dept. 5505, Streator, Illinois

Circle No. 10 on Reader Service Card for more information



## in **YOUR** cost reduction program

**START HERE**

... then standardize on

**KENNETH**

**vulcanized fibre**

**"job designed" receptacles for industry**



**NEW KENNETH CATALOG**

Here's your personal guide to the finest materials handling equipment ever built. Write for your free copy of catalog 54 direct to Dept. L.

**FIBRE SPECIALTY DIVISION  
NATIONAL VULCANIZED FIBRE CO.**

WILMINGTON 99, DELAWARE

In Canada: National Fibre Company of Canada, Ltd. • Toronto 3, Ont.

VULCANIZED FIBRE • PHENOLITE LAMINATED PLASTIC • VUL-COT WASTEBASKETS • TEXTILE BOBBINS

Circle No. 59 on Reader Service Card for more information

## HE-MAN COMPLEX...

(Continued from page 69)

machine were injured seriously when it tipped over. In his investigation, our engineer found that the foreman and his group leader gave conflicting orders. The men got confused—and smash, a bad accident. In a team lifting job, there should be but one boss giving the lift, carry and set down orders.

In another case, one of our engineers was asked to investigate three accidents that occurred within a week in the same department of a plant. The Engineer found that the men in the department had to move fairly large boxes. The foreman invariably assigned a tall man and a much shorter helper to the job, both very strong men. But this idea didn't work. In a lifting operation involving two or more men, it's important for balance—and safety—that the men be close in size and physique.

### Pinching Accidents

In one shop the hand-pinching problem was practically eliminated by widening the doorways to the storage rooms. Employees had been banging their hands at the doorways because the clearance was too close.

A large number of pinched hands result when objects are lowered to the ground. Employees should be shown that setting an object down is just the reverse of the lifting process—that one corner of an object should be set down at a time to enable the fingers to be removed safely.

A large number of pinching accidents result when materials are being placed in or taken from storage areas. In one shop, the trouble was traced to "he-men" who tried to lift boxes directly into place in tight spaces rather than slide them into place.

The sliding rule is violated many times when material is deposited on benches or tables. Here again, the correct procedure is to place the material on the edge and then slide it the rest of the way.

Other pinching mishaps result from the use of accessories for

manual handling, such as crow-bars. The biting end of any crow-bar used as an accessory should be sharp, and the worker should keep his hands in a position where they won't be pinched if the bar or the object being moved should slip.

When aids such as trucks, wheelbarrows and dollies are used, knuckle guards will reduce the danger of smashing the hands against doorframes, posts and machinery.

#### Accidents From Falling Objects

In most cases, accidents in this category can be traced to failure to follow instructions, lack of proper education, or both.

Workers should be taught to get a firm grip on an object before they try to lift it and never to change hand positions without first setting the object down. In cases where a not-too-heavy object must be carried a long distance—especially if the route involves going up stairs and ramps—two men should be assigned to the job, even if one protests that he is man enough to handle it himself. A man's gripping power can give way suddenly over a long trip.

#### Failure To Wear Safety Shoes

Some time ago, the safety director of a good-sized plant complained that, although the men responded well to all other phases of his safety program, they refused to wear safety shoes—despite a high incidence of foot and toe accidents.

It was found that the women in the plant were the cause. Every man was subject to ridicule from women workers whenever he wore a pair of safety shoes. It seems that the reason for the feminine scorn was a fear that they, too, would be asked to wear safety shoes, and that the shoes would not be attractive.

Today, however, this particular objection can be written off as unfounded since it's virtually impossible to tell many safety shoes from the street variety.

In a large number of cases, the safety prescription for foot and toe injuries probably will include

# OPPORTUNITY!

## Manufacturer's Agents WANTED

### NEW management for new

owners seeks manufacturer's agents and representatives for time-proven quality line. Backed by 86 pioneering years in metal fabrication, this nationally accepted complete Penco line is receiving powerful sales impetus from alert, experienced and aggressive management.

### penco

#### OFFERS:

- Protected distribution sales policy
- Competitive prices
- Effective national sales promotion, literature and advertising
- On-time delivery assured because we are a division of our steel supply source—Alan Wood Steel Company.

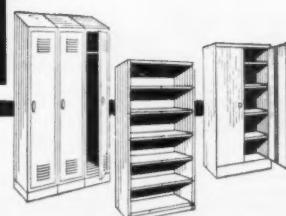
#### WE PREFER:

- Stocking dealers—agents or reps with inventory facilities
- Agents not handling too many lines—but with capacity to handle a substantial volume of Penco products
- Association with the following fields: Industrial; Building and new construction; School and institutional.

We urge you to investigate this opportunity today. Write, or call William W. Ogren, General Sales Manager—Howard 7-5300.

### penco METAL PRODUCTS DIVISION

ALAN WOOD STEEL COMPANY  
Oregon Ave. & Swanson St.  
Philadelphia 48, Penna.



### penco

STEEL LOCKERS  
CABINETS • SHELVING

Circle No. 119 on Reader Service Card for further information

## HE-MAN COMPLEX

Continued

a recommendation for safety shoes in combination with safer working practices and the elimination of certain environmental hazards.

For example, when rollers are used to move heavy and bulky materials, toes can easily be crushed when the direction of the move is changed. Workers should be taught to use only bars and sledges—instead of hands and feet—when they're working with the aid of rollers.

If hand trucks, wheelbarrows and dollies are not equipped with brakes or devices to keep them from rolling during the loading process, the wheels should be blocked to keep equipment firmly in place. A supervisor or a worker should be charged with the responsibility of seeing to it that loads are well balanced and will not fall off.

The wheels of mobile manual handling equipment should be well under the loading surface to help eliminate hazards to toes and feet. Installation of wheel guards also will help.

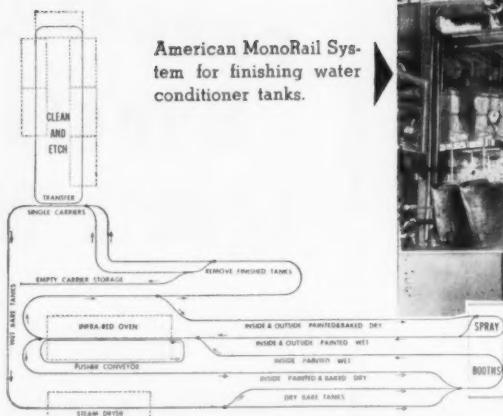
### Standing In Unsafe And Crowded Areas

Although a number of factors are involved in this type of mishap, these accidents would not have occurred had not the victim been in the wrong place at the wrong time.

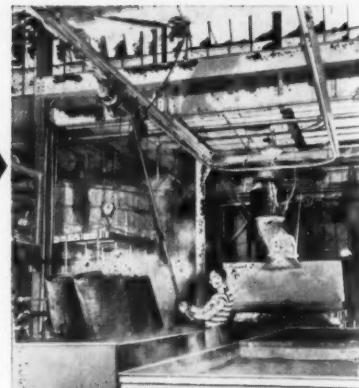
In one shop, the solution was the re-routing of materials and changing of the traffic pattern. Another company installed small stop signs at blind corners. A third establishment changed the route employees took to get to the washroom, which was near a storage area.

### Failure To Wear Hand Protection

Handling many types of material requires hand protection, especially if the material has sharp points and edges. If sheet metal is to be carried, hand leathers or gloves reinforced with metal inserts should be used. In some



American MonoRail System for finishing water conditioner tanks.



Finished tanks from spray booths (rear) roll to pusher conveyor in foreground.



Costs are cut every step from cleaning and etching to finished tanks in this continuous operation by American MonoRail. For this manufacturer the up-and-over system of materials handling boosted production, improved space utilization, cut damages to material and improved both working conditions and production control.

If you have a materials handling problem, call your nearby American MonoRail engineer. He is qualified to help you solve it.

up and over

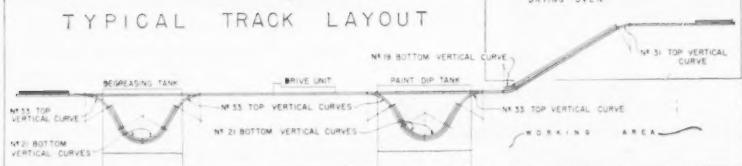
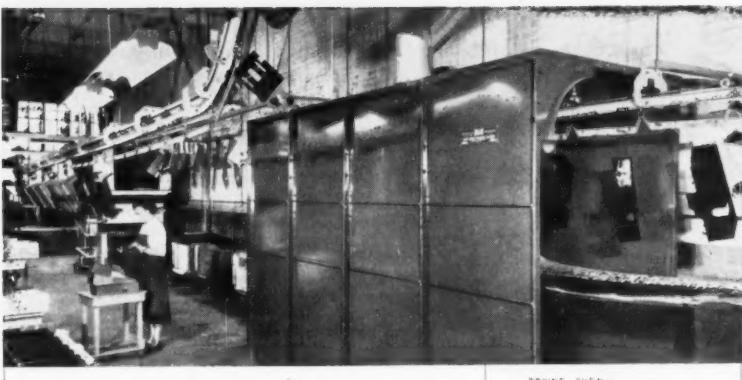
"Up-and-Over" is the title of our 16-mm. sound film to solve many tough handling problems at low cost. Please allow three weeks to schedule showing.



Member of Materials Handling Institute - MonoRail Association

**AMERICAN** **MONORAIL** COMPANY  
OVERHEAD HANDLING EQUIPMENT  
13129 ATHENS AVENUE • CLEVELAND 7, OHIO  
Circle No. 7 on Reader Service Card for more information

FLOW



Degreasing, finishing, and oven-drying of space heater parts are efficiently handled overhead in less than 118 feet of overall floor area by Landahl Chainless Conveyors. Hang-on type load bars, between trolleys permit extremely close spacing of small parts.

Landahl Conveyors have no chain to wear, no cable to sag, no sprockets needed. Landahl offers short radius turns, low cost maintenance, low initial cost, ball and socket universal joints, and caterpillar drive.

For the whole story write today for Bulletin G-100.



The LANDAHL CONVEYOR CO., 13129 Athens Ave., CLEVELAND 7, OHIO

A SUBSIDIARY OF THE AMERICAN MONORAIL COMPANY

Circle No. 8 on Reader Service Card for more information  
DECEMBER, 1955

cases, the wrists as well as the hands should be protected. Gloves used in carrying objects should be clean of oil and grease. The proper type glove should be used—such as leather or leather-faced gloves which are better for gripping than cotton or rubber gloves in the handling of smooth metal.

Management has everything to gain and nothing to lose from a program to eliminate the seriousness of the material handling accident problem. It should take the initiative in a drive that combines the three basic "E's" of safety—Education, Engineering and Enforcement. The good program will include a study of the handling accidents, elimination of environmental hazards, introduction and demonstration of safer handling methods, and arousing in our "he-men" a healthy respect for skill.

#### MANUAL HANDLING . . .

(Continued from page 97)

Use of color for safety is highly recommended. All trucks should be painted a brilliant color—even when it is supposed they will only be operated under well-lighted conditions. This is doubly true, of course, when trucks are used or temporarily stored in dark areas. But even when such is not intended, color should be used to guard against the unexpected.

Rules of operation, together with a program of training and enforcement, should be mandatory in every plant. The best designed truck, a truck correctly chosen for the job, will not give maximum effectiveness and safety without an operator who knows his job and is constantly reminded of the best practices.

This cannot be emphasized too much because we have found a severe lack of such programs in many companies. Where operators are constantly reminded of the importance of safety, we have found that efficiency goes up and accidents go down.

## INTEGRATED HANDLING . . .

(Continued from page 82)

bination of paint and surface preparations that will provide maximum life and safely permit greater intervals between re-painting, ensuring protection at minimum cost. Note, that surface preparations—like mechanical brushing, chipping and sandblasting—

often represent a major part of the above cost. Moreover, in so doing, the structures have to be protected by using tools which do not create hazards from sparks and/or static electricity.

**Galvanic Corrosion** is encountered for storage tanks and pipe lines which rest on soil or are buried underground. Cathodic protection is employed to prevent this. It is a method by which we try to maintain a negative charge, which will neutralise the hydrogen

ions in the soil throughout the entire surface of the equipment. The efficiency of the cathodic protection will be increased by the use of such details as sectionalizing, proper location with respect to the other lines, cross bonding, and avoiding unnecessary exposure. Results of corrosion studies should be incorporated in the design and construction of such types of handling equipment.

Routine replacements or reconditioning of tanks and lines may be achieved—and thus prevent shutting down of operations—by the use of the device called the *Penetron*. This uses the tremendous penetrating power of primary and secondary gamma radiation to measure, non-destructively and from one side only, the thickness of the walls of piping or vessels.

### Dust, Fumes, Mist, Vapors:

Before a discussion of these problems, brief definitions terms are relevant.

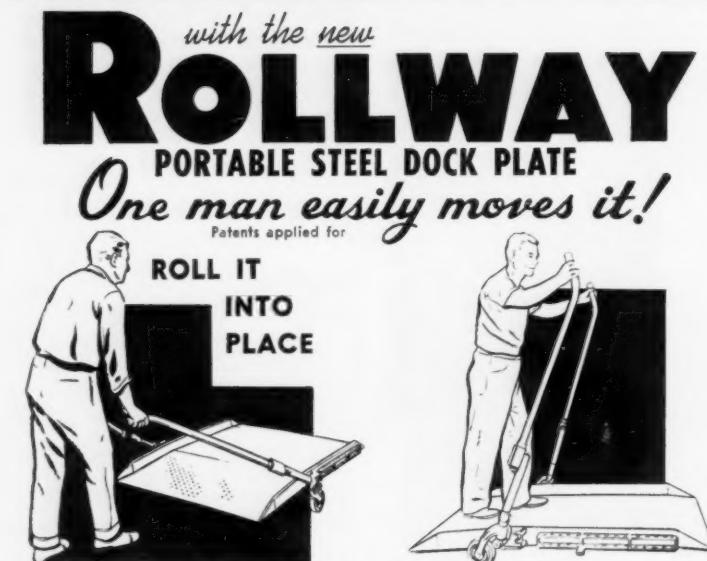
**Dusts** may be defined as solid particles generated by handling, crushing, grinding, rapid impact, detonation and decrepitation of organic materials such as rock, ore, metal, coal, wood, grain, etc. Dusts do not tend to flocculate except under electrostatic forces; they do not diffuse in air but settle under the influence of gravity.

**Fumes** are solid particles generated by condensation from the gaseous state, generally after volatilization from molten metals, etc., and are often accompanied by a chemical reaction such as oxidation. Fumes flocculate and sometimes coalesce.

**Mists** are suspended liquid droplets generated by condensation from the gaseous to the liquid state, or by breaking up a liquid into a dispersed state, such as splashing, foaming and atomizing.

**Vapor or Dust Explosions** result when the products of combustion from a flash fire are sufficiently confined to generate pressure. Explosion presupposes a sudden violent change of pressure, characteristically involving the

**SAVE TIME & MONEY ON YOUR LOADING DOCK...**



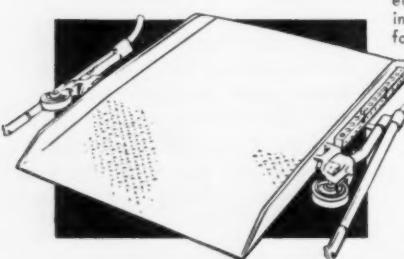
One man easily handles the ROLLWAY like a two-wheeled warehouse truck—even the sizes that weigh more than 500 lbs.

### MOVE HANDLES FORWARD AND DOWN . . .

As the handles are moved forward and down, the wheels automatically move off the floor letting the ROLLWAY down into position for use. No fingers need be under edges to be injured. On models with folding wheels the wheels also automatically fold to a flat position below the tops of the side rails. The handles can be telescoped completely out of the way.

### READY FOR USE . . .

To remove the ROLLWAY after use, one man simply moves the handles up and back which automatically raises the plate and moves the wheels back into position for easy rolling.



Step up the efficiency of your materials handling operation right away. Write for complete information and prices on the various standard models of the NEW ROLLWAY PORTABLE STEEL DOCK PLATE!

**WOODFORD MFG CO**

1629 DELAWARE AVE.

DES MOINES, IOWA

Circle No. 160 on Reader Service Card for more information

liberation and expansion of a large volume of gas due to high temperature. Dust explosions occur in any combustible dust or any material that will burn or oxidize. These include some metallic dusts. There is a certain range for the percentage of dust and air, within which these explosions may occur, their degree of flammability depending on their moisture content and fineness of dust. Any volatile liquid that will give off flammable vapors at or below ordinary temperature (room temperature) are considered hazardous from the fire prevention standpoint. The inherent fire and explosion hazards depend not only on the flash point but also on the apparent ignition temperature, explosive range, vapor density with respect to air diffusibility of the vapor in air, etc. Data on the properties of these fluids can be had from the Fire Protection Association Publication, "Fire Hazard Properties of Certain Flammable Liquids, Gases and Volatile Solids".

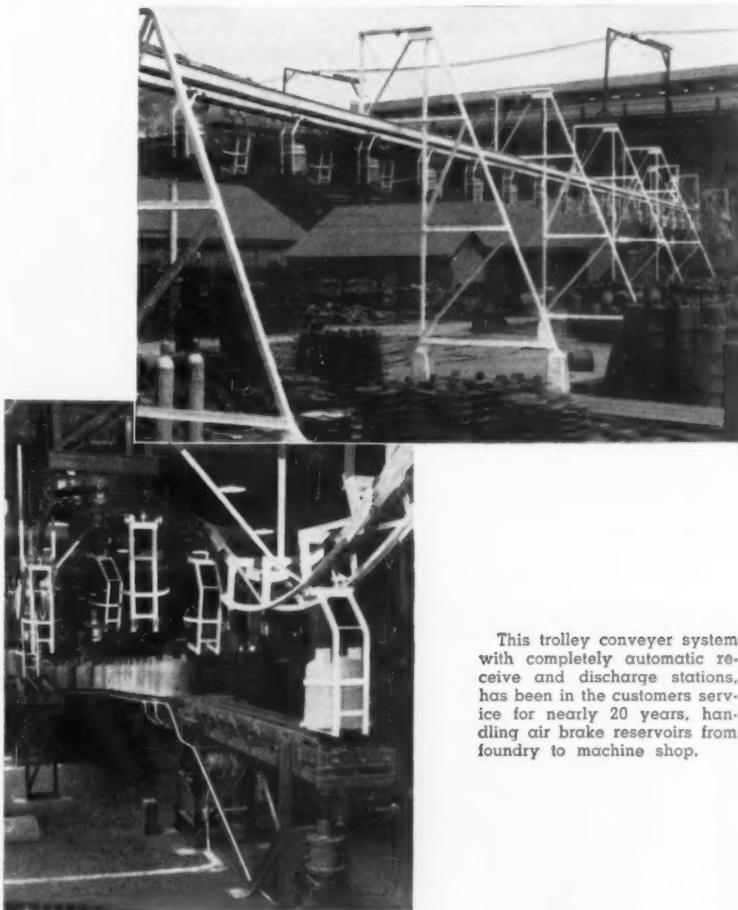
**Static Electricity** may develop from the handling of materials—solids, liquids or gases—or from the operation of equipment such as belts. The handling of dry granular substances—such as sulphur in metal chutes, bins, or even through relatively dry air—will generally result in the generation of static electricity, the discharge of which, in the presence of flammable dusts or vapors, is dangerous.

Therefore, in handling operations involving dusts, fumes, flammable vapors, etc., care is to be taken—not only to prevent explosion and fire hazards but also to prevent atmospheric pollution, safeguarding the health of operators and preventing the contamination of chemical materials and products.

#### Preventive Measures:

For elevators and conveyors, dust- and air-tight casing of proper material is recommended to prevent contamination, or screens to avoid contact with sparks or fire. Explosions can be avoided by the use of low-oxygen-content gases in conveying systems.

# Automation... A New Word for an Old Idea



This trolley conveyor system with completely automatic receive and discharge stations, has been in the customers service for nearly 20 years, handling air brake reservoirs from foundry to machine shop.

The Engineers in the Conveyer Industry have been working at Continuous Flow Material Handling for a long time. The first Mathews equipment, for example, was built over 50 years ago, and although comparatively simple, was applied to do exactly what is expected of today's highly special conveying machinery—to help manufacturers produce more, at less cost.

Call it Automation, Continuous Flow, Technocracy—call it what you will. The results are the same—more good things for a greater number of people.

Whatever your product—whether you measure its weight in pounds or tons—if it must be handled, there are Mathews Conveyers to do the job efficiently.



**MATHEWS CONVEYER COMPANY**  
GENERAL OFFICES . . . ELLWOOD CITY, PENNSYLVANIA  
PACIFIC COAST DIV., MATHEWS CONVEYER COMPANY WEST COAST,  
SAN CARLOS, CALIFORNIA  
CANADIAN DIVISION . . . MATHEWS CONVEYER COMPANY, LTD.  
PORT HOPE, ONTARIO

Engineering Offices or Sales Agencies in Principal American and Canadian Cities  
Export Representative—Foreign Trade Division of New York Hanseatic Corporation

Circle No. 104 on Reader Service Card for further information

The principle of fluidized solid mass may be utilized for dustless and noiseless operation in certain cases. For example, in cement plants pulverized material can be handled in an air-activated gravity conveyor. In this method, the mass flows through a horizontally split tube, with the low pressure air maintained in the lower half of the tube, separated from the commodity by a permeable sheet. Seepage of air serves to keep the pulverized material fluidized while it follows a gravity flow.

Other safety provisions include construction which will vent or release explosive pressures, such as light-weight panel, venting of chutes, and grounding of handling equipment where static electricity is likely to develop.

For applications requiring resistance to heat, glass-fiber-rubber belts have proved satisfactory. This belt is successful for carrying hot, fine chemicals up to 530 degrees F. It is not recommended for glowing heavy lumps; nor is it very resistant to abrasion. For

services at temperatures exceeding 500 degrees F., steel or wire mesh belts are usually chosen. In general, cast iron linings for moderate temperature and refractory linings for high temperature are recommended to avoid heat difficulties.

Furthermore, it is important to keep the premises of the plant scrupulously clean, and to eliminate all sources of ignition. At this point, the necessity of adhering carefully to recommendations of the National Fire Protection Association is to be clearly understood.

**Poisonous and Radio-Active Hazards:** Since there is a whole field of industrial hygiene engineering covering this topic, only very brief references are made on these hazards.

Dusts, fumes and mist, beyond certain permissible range, cause dangerous diseases like pneumoconiosis, by exposure, inhalation or ingestion. Poisoning due to lead, antimony, beryllium, cadmium and alkaline substances like arsenic, phosphorus, selenium, sulphur, etc., needs very careful attention, and methods of controlling them are to be instituted as conditions demand.

Similarly, industrial gases and vapors of various classifications like irritant gases, asphyxiants, volatile drugs and drug-like substances—as well as inorganic and organic-metallic poisons—need very active attention in plants handling these materials.

#### Radiological Safety

The general hazards in handling radio-isotopes are:

1. Deposition of radio-isotopes in the body
2. Exposure of the whole body to gamma radiation
3. Exposure of the body to beta radiation
4. Exposure of the hands or other limited parts to beta or gamma radiation.

The principles underlying protective measures are:

1. To prevent ingestion, inhalation, interstitial, or other modes of entry into the body.
2. To reduce the amounts of external irradiation to permissible levels.



World's largest  
producer of  
power sweepers  
for cities and  
industry

## Brings its Years of Engineering Know-how to **AUTOETTE**

*the new concept of transportation for  
industry, community life and play*



Autoette offers complete nation-wide service and distribution. For descriptive material and deliveries write Dept. T, 730 West Esther Street, Long Beach, California.

Circle No. 15 on Reader Service Card for more information

**AUTOETTE**  
World's Lowest-Cost  
Transportation

**Miscellaneous Problems And Their Cures.** Unloading sticky and slushy materials and substances which tend to freeze or coke, handling fragile materials which might become destroyed, and certain others which tend to degrade in handling comprise a few of the miscellaneous headaches encountered in the chemical industry.

Sticky, slushy and wet materials are handled by many different devices—depending on the type of the material and the equipment used. In certain cases steel band conveyors—with smooth, dense surface—are used for better discharge of sticky materials. A belt turnover system permits the clean side of the belt to contact the return idlers, thus preventing build up on idlers—in addition to preventing abrasion and corrosion. When using bins for the storage of bulk products, failure of the material to discharge through the restricted opening may be cured by:

1. Improved bin level indicating machines.
2. Bin discharging devices like high frequency vibrators, aerated devices for fluid flow in low density bulk materials, etc.
3. Large amplitude displacement panel.

For fragile and degrading types of materials, proper handling equipment has to be selected according to needs. Degradation is usually encountered at transfer points in belt conveyors since the maximum distance travelled in any one conveyor is usually within ten miles. However, in recent years the maximum length has been greatly increased by the introduction of steel cable fabric in place of cotton fabric.

Developed in England, tension principle incorporates two driven steel cables carrying the tensile load with an ordinary single-ply cotton belt between them to support the commodity. Further advance towards longer belts was the introduction of intermediate drive stations on the single flight.

For illustrations, *FLOW* thanks Automatic Switch Co.; Baldwin-Lima-Hamilton Corp.; Gerotor May Corp.; The Howe Scale Co.; The Jeffrey Manufacturing Co.; Link-Belt Co.; M-H Standard Co.; Richardson Scale Co.; Stephens-Adamson Mfg. Co.; and Toledo Scale Co.

## "YOU SEE BUFFALO CONVEYOR BELTS

*Everywhere*



OVER  
200 SIZES  
35 WIDTHS  
7 THICKNESSES

### RUBBER FILLED & COVERED BELTING

Buffalo's regular solid woven cotton conveyor belting has been rubber filled and covered to produce this water and wear resistant belt for you. This tough, long-lived and economical belt will track perfectly and wear longer for rugged jobs such as vegetable and fruit washing, sorting, etc. Can you use this belt for this or other applications in your business?

### IN THE CANNING INDUSTRY experts insist on our R F & C for WASHING & SORTING

Want to know what's so important about Buffalo Conveyor Belts? It's the bounce in the cotton that counts! Our exclusive WOV-IN-WEAR process tightly weaves sturdy cotton yarn into TOUGHER, LONGER LASTING Conveyor belting with two outstanding characteristics. (1) Woven cotton has little resistance to impact. It absorbs normal production blows and bounces back into its original form. (2) Because it's WOVEN, it ALIGNES ITSELF instantly to your conveyor. It won't fight obstacles! It just molds itself AROUND them. That means far less wear than supposedly tougher materials and . . . Buffalo Belts cost only a FRACTION of heavier, plied-up belts. Get the facts! In your business we enthusiastically recommend the belt shown at the left.

#### WRITE FOR FREE FOLDER

Tells how to Buy the Right Conveyor Belt for your Particular Job. Illustrated Uses, Maintenance Tips, Sizes, Prices.



## BUFFALO WEAVING & BELTING COMPANY

209 CHANDLER STREET NEW YORK 7, NEW YORK  
NEW YORK PHILADELPHIA CHICAGO DETROIT LOS ANGELES

Circle No. 25 on Reader Service Card for more information

# Top Tractor-Shovel Operator Overcame Handicap

WHILE most material handling equipment features built-in safety devices and is said to be easily operated, the Electro-Manganese Corporation in Knoxville, Tennessee, went one step further and modified a tractor-shovel so that a one-armed employee could become one of the company's "most-skilled and most-productive" operators.

An industrial accident cost Earl Kirk his left arm, but he came back to work to later hold down a man-sized job in the production line. When the firm purchased a tractor-shovel, Kirk asked to be assigned the unit. Slight modifications in the controls, an extension to the hydraulic bucket control lever so Kirk could manage it with the hook on his substitute left arm, and addition of a steering knob, has enabled this handicapped employee to operate the machine with such skill that he has become one of the firm's most valuable workers.

Courtesy Frank G. Hough Co.



## "PALITON"—

One Large Capacity—  
4,600 lb.—at the  
Same Low Price



Fork Lengths 36"-42"-48"  
Widths 20½" and 27"  
Specials to Order.



Threeway Control for  
Raise, Lower and  
NEUTRAL Giving FREE  
HANDLE for Towing.



STOCKS AND SPARES  
HELD BY ALL OFFICES

HEAD OFFICE:

**OMIC, Ltd.,**  
9 George St.,  
London, W.I. England

CANADIAN OFFICE:

c/o **CONVEYANCER,**  
18 Ingram Drive at Keele Street,  
P.O. Box 14, Station D,  
Toronto, Ont., Cherry 1-1551

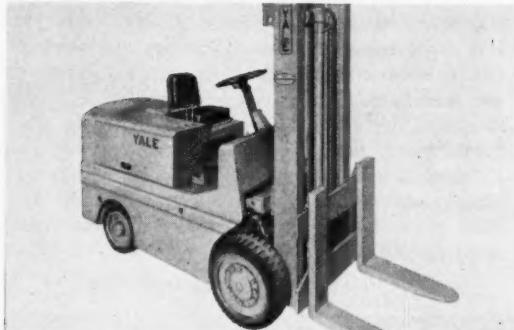
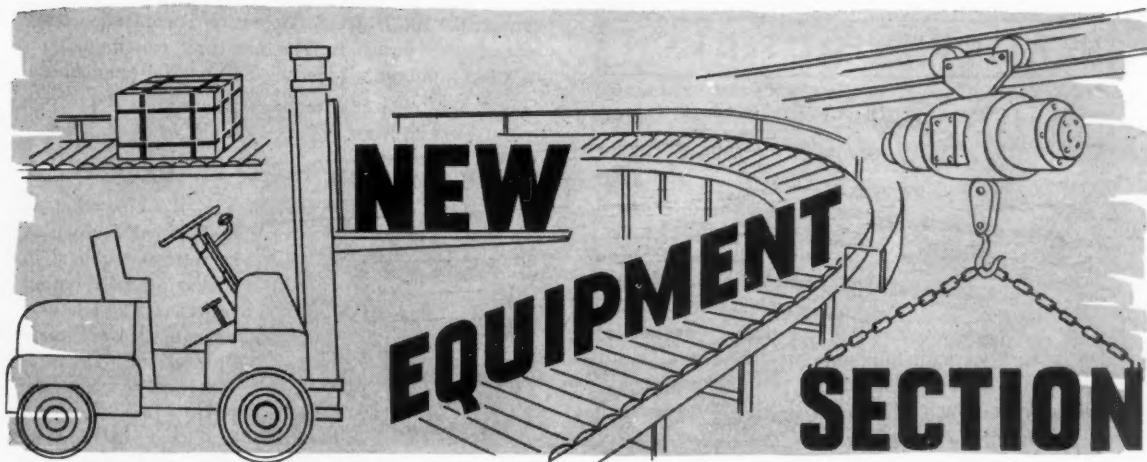
NEW YORK OFFICE: **PALITON, Inc.**, 40 West 29th St. • New York 1, N.Y. • Murray Hill 5-9323

Circle No. 116 on Reader Service Card for more information



The Paliton Hand Pallet Truck  
With Five Inch Hydraulic Lift.

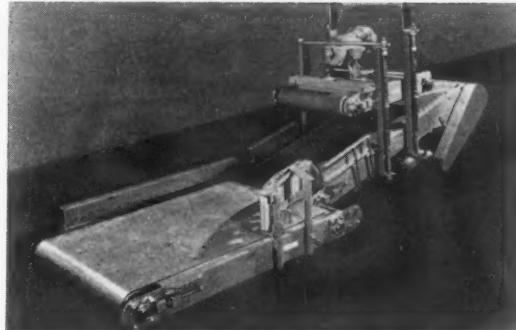
WRITE FOR  
ILLUSTRATED  
LITERATURE



#### Faster, Smoother Handling

Fully automatic gear shifting, permitting faster, smoother material handling with greater operator comfort and safety, is featured on the new Model KGA51 line of trucks offered by The Yale & Towne Mfg. Co. Capacities range from 3000- to 8000-pounds.

**Circle 226 for more information**



#### Bag Flattener

Less room is required to stack bags after they've passed through this power driven bag flattener that squeezes out the air. The machine's upper and lower deck, individually powered, are synchronized. Various widths and power units by Sage Equipment Co.

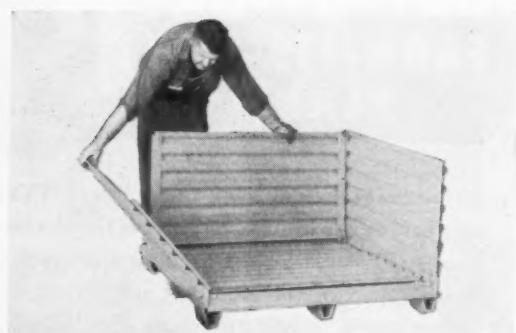
**Circle 228 for more information**



#### "Economical" Dollies

All-magnesium pallet dollies that provide maximum strength with minimum weight are available from Magline, Inc. The lightweight units are said to facilitate quick, efficient manual positioning, resulting in faster, more economical material flow.

**Circle 227 for more information**



#### Collapsible Containers

Collapsible pallet-type steel boxes for storage, shipping and other uses have been introduced by Hamlin Metal Products Company. Called Hamlintainer, the units are lightweight and heavy-duty, and can be assembled in less than 20 seconds, it is claimed.

**Circle 229 for more information**

## NEW EQUIPMENT SECTION

### All-Steel Welded Skids



New all-steel skids, semi-skids, and floor trucks from Market Forge Company feature all-steel welded longitudinal panels engineered for maximum strength, versatility and clean lines with minimum weight. The units are said to be non-contaminating, easily cleaned, non-breakable and low cost.

Circle 230 for more information

### Bigger Payloads



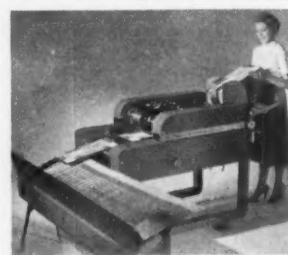
Model SF-5 bulk material body with full hydraulic operation offers faster delivery, bigger payloads and less maintenance, claims Baughman Mfg. Co. Available in lengths from 10- to 34-feet, truck or

trailer mounted, with chain and flight or belt dis-

charge, the full hydraulic operation is controlled from rear-of-body positions. The new unit can unload up to a ton a minute, depending on material handled.

Circle 231 for more information

### Carton Imprinter Helps Inventory



A machine that is said to solve a major inventory problem in packaging is a carton imprinting machine introduced by Pitney-Bowes, Inc. It automatically feeds, imprints and power-stacks at a rate of speed of 10,000 pieces

an hour. The imprinter is claimed to replace hand-stamping of packing materials and hand-affixing of labels and enables users to eliminate large, varies and expensive inventories of cartons and other containers ordinarily printed in advance in different sizes and quantities. Cartons can be imprinted as they are needed. Chief advantages of the machine are said to be its speed, flexibility, simplicity of operation and its clean, sharp imprints on "difficult" materials, including heavily waxed surfaces. Designated as Model 4800, it can handle any unit from small envelopes to large cartons.

Circle 232 for more information

**RENT OR BUY  
SILENT HOIST  
*LIFTTRUK*  
on the  
"DAY-BY-DAY  
EARN-ITS-WAY  
PLAN"**

3-5-7½-10-15 ton  
CAPACITIES



If you can reasonably use a Heavy Duty LIFTTRUK for at least two hours a day average, to improve the movement of goods in process or reduce materials handling operations, then you should be interested in this unusual "rent-or-pay-as-you-use" plan. Proper cost accounting methods often show that man-hours saved, storage space gained, or time in transit reduced, add up to a profit well above the payments required for LIFTTRUK for purchase or rental charges.

Write for "Earn-Its-Way" Plan to



**SILENT HOIST & CRANE CO.**

Pioneer Mfrs. of Heavy Duty Materials-Handling Equipment  
888 63rd Street, Brooklyn 20, N.Y.

Circle No. 130 on Reader Service Card for more information

**Ready Soon . . .  
Order Now . . .  
The 1956-57  
FLOW Directory**

**FLOW DIRECTORY**  
1240 Ontario St. • Cleveland 13, Ohio

Send me ( ) copy(ies) of the 1956-57 FLOW DIRECTORY as soon as it is available at \$6.50 a copy.

Check enclosed ( ) Bill me ( )  
Bill my company (Order No. )

Please make checks payable to FLOW DIRECTORY. Ohio sales—add 3%.

Name \_\_\_\_\_

Company \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_

**FLOW**

## Expendable Pallet Features New Design

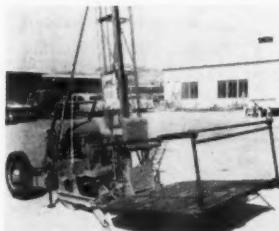


Titan Products Company has developed a one-ton capacity expendable paper pallet employing a new design and principle.

Shipped knocked-down, the pallet can be folded and wire stitched or stapled as needed in only 30 seconds, it is claimed. Weight of the pallet, which can be stacked four-high, is four pounds. Safety factors include fire and moisture proofing. User name and/or product can be imprinted on the pallet in manufacture if desired.

Circle 233 for more information

## Construction Elevator

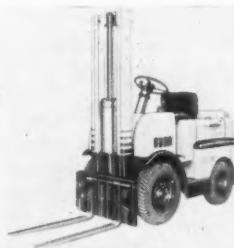


The Tusky Hoist is a completely portable and automatic construction elevator that can be towed by truck or car fully assembled to the jobsite and erected in two-and-a-half minutes by one man. Ready for towing, the hoist weighs 2650 pounds, is 26 feet long,

96 inches high and 70 inches wide. It is free-standing at 24 feet, but extra sections can be added to make the tower more than 100 feet high. A two-cylinder gasoline engine coupled to a hydraulic unit drives the platform with a load of 1000 pounds up or down at 100 fpm. The unit is available from Tubular Structures Corp. of America.

Circle 234 for more information

## Pneumatic Tired Fork Truck Designed For Light Floors



Allis-Chalmers Manufacturing Company, Buda Division, has introduced a new pneumatic tired fork truck with a 3000 pound lifting capacity and 24 inch load center. Available with either Diesel, gasoline or LP gas engines, it can be

equipped with Budamatic torque converter transmission as optional equipment. Designed Model FTP30-24, the truck was specifically engineered for installations with serious floor loading problems, and is said to offer greater floatation, reduced weight concentration, and more even weight distribution.

Circle 235 for more information

## Custom Racks at \*Mass Prices!



# STORACK

MULTI-PURPOSE STEEL FRAMING  
AMERICAN STEEL & IRON WORKS • CHICAGO 21, ILL.

\*Adjustable to meet your exact needs today or tomorrow—MASS PRODUCED to give you low first cost—and with low installation cost because of their labor-saving design.

### USED BY LEADING COMPANIES

StoRak steel framing is ideally adapted to the quick-changing needs of the "automation age". It costs less to assemble, changes can be made easily during construction. It is completely adjustable—installations can be altered, rearranged, taken down, re-erected. Requires no special tools, no drilling or welding. With StoRak you can build racks of any kind, shelving, work tables, motor mounts, cable, pipe and duct support framing —plus hundreds of construction applications. Used and approved by hundreds of the country's largest companies.

### SEND FOR CATALOG

giving full detailed specifications, available standard fittings, load specifications, applications and prices.



American Steel & Iron Works,  
58th & Lowe Ave., Chicago 21, Illinois

Send me latest complete catalog and specifications on  
StoRak Multi-purpose Steel Framing.

Name \_\_\_\_\_

Firm \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

Circle No. 14 on Reader Service Card for further information

DECEMBER, 1955

## NEW EQUIPMENT SECTION

### Bottlers Truck



Tubular steel hand trucks in six basic types have been introduced by M-H Equipment Co., Inc. A wide selection of wheels is offered ranging from 5" by 1-1/2" solid rubber to 10" by 3.50" pneumatics with tube. Stair climber is of channel iron to provide maximum strength without useless weight. The Model 21 pictured was designed primarily to fill the needs of the soft drink bottling industry. Wheel hubs are recessed to protect dealers stock.

Circle 236 for more information

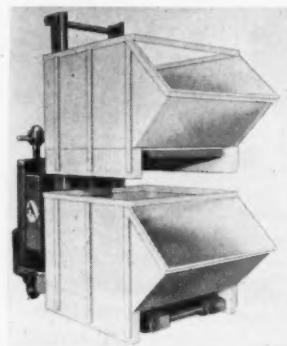
### Safety Mirrors

Two larger sizes of circular convex glass mirrors have been added to the line of Lester L. Brossard

Company. Measuring 30 inches in diameter and 36 inches in diameter, the mirrors are especially designed for use where blind corners, cross aisle intersections, entrances and exits present a problem due to traffic accidents. The mirrors clearly reflect the movement of oncoming floor traffic from opposite directions, are said to be easily installed and quickly adjustable for any desired angle.

Circle 237 for more information

### King Size Containers

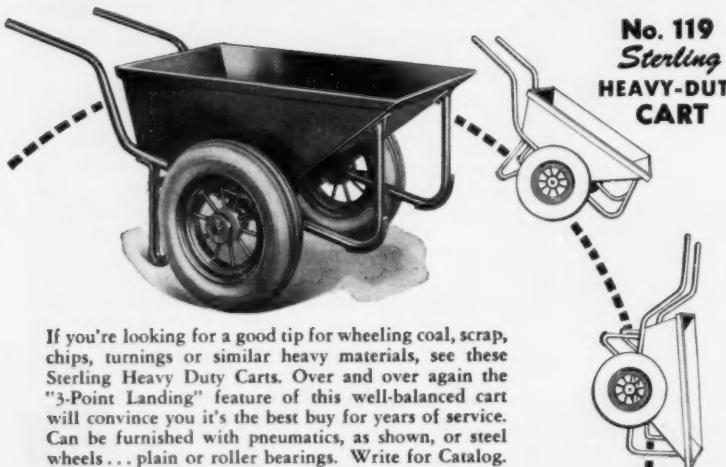


Designed for more efficient bulk parts handling and storage is this king size container which is 36 inches wide by 24 inches deep by 48 inches long, including 12 inch hopper. Construction is of all welded, heavily reinforced sheet steel. Hopper front permits visibility at all times and easy accessibility. May be safely stacked

as high as desired, according to Stackbin Corporation, which says the units are ideal for manufacturing operations involving high speed, long and repetitive runs.

Circle 238 for more information

## YOUR BEST Tip IN CARTS



If you're looking for a good tip for wheeling coal, scrap, chips, turnings or similar heavy materials, see these Sterling Heavy Duty Carts. Over and over again the "3-Point Landing" feature of this well-balanced cart will convince you it's the best buy for years of service. Can be furnished with pneumatics, as shown, or steel wheels... plain or roller bearings. Write for Catalog.

#### 3 SIZES AVAILABLE:

No. 119.....	7½ cu. ft.
No. 120.....	9 cu. ft.
No. 121.....	11¼ cu. ft.

STERLING WHEELBARROW CO., Milwaukee 14, Wis.



Circle No. 134 on Reader Service Card for more information

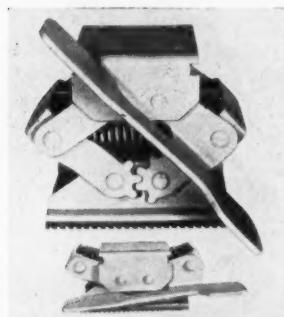
144

A HALF CENTURY  
OF PROGRESS



Circle No. 22 on Reader Service Card  
**FLOW**

### New Truck Lock



No fixed mounting height is required for the new Presto 5-in-1 truck floor lock which can be used with five different size casters. Constructed of all-steel, the lock may be bolted or welded into place. Features pointed out include: low price; gear controlled leverage; pressure dual spring loaded; easy to

apply and release; large friction moulded neoprene rubber pad; lightweight; strong; durable; trouble-free. The manufacturer is Presto Products Co. Division of Lee Engineering Co.

Circle 239 for more information

### Stitcher For Full-Overlap Boxes



A wire stitching machine which stitches the outer and inner flaps of full overlap corrugated cartons after they have been filled has been developed by Acme Steel Company. Called the Model HOHT Silver-stitcher, it is said to be particularly efficient in closing narrower sizes of full overlap boxes.

It can also be used to fasten sides of five-panel folders, the outer and inner sections of telescope boxes and various double or triple slide boxes.

Circle 240 for more information

### Rip-Cord Strapping Package



Rip-cord package is said to save time in shucking coils of Stanley Steel Strapping from protective paper wrappings. The user first cuts a steel band sealing the coil. Then, he grasps a dangling end of stout manila twine and, in a swift, circular pull slits the wrapping. For shipment to the user, coils are steel-strapped to

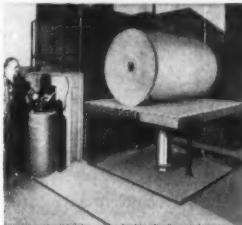
wooden pallets for ease of handling and safety. Developed by The Stanley Works, Steel Strapping Div.

Circle 241 for more information

DECEMBER, 1955

**SPEED  
MATERIAL HANDLING  
with JOYCE  
HYDRAULIC...**

### ...MATERIAL LIFTS



**save floor space...  
save manpower**

Joyce single or multiple post "Materiallifts" will be engineered to fit your requirements as to size and type of platform, lifting capacity and type of controls. Available with air-oil or electric pumping unit operation . . . always locked on oil for greatest safety.

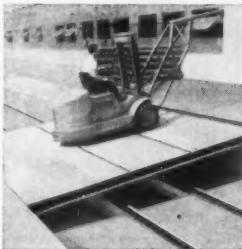
### ...VARI-RAMPS



**simple to install...  
economical to operate**

These compact units feature roll-over capacities to suit. Available in two types . . . electric pumping unit and air-oil operated . . . push button, hand or foot valve control . . . automatic leveling. Joyce "Vari-Ramps" are manufactured with platform sizes and vertical movements to your specific requirements.

### ...CROSS-OVER BRIDGES



**custom built to meet  
your requirements**

Joyce cross-over bridges are available in the following styles, Bascule type, Vertical rise type and Horizontal rotating type. They are available with platforms of shape, size and capacity to meet your requirements . . . full hydraulic air-oil or electric pumping unit operation . . . push button, hand or foot valve control.

Also manufacturers of a complete line of Elevator Components, Hydraulic Feed Tables, Factory Truck Lifts and Industrial Jacks. Suppliers of heavy duty lifting equipment to world industry since 1873!



**WRITE TODAY FOR  
COMPLETE INFORMATION!**

IN CANADA: Midland Foundry & Machine Co., Ltd., Midland, Ontario

**THE JOYCE-CRIDLAND CO.  
DAYTON 3, OHIO**

Circle No. 85 on Reader Service Card for more information

## NEW EQUIPMENT SECTION

### Less Maneuvering



Hydraulically controlled forks that swing and shift with the load, eliminating unnecessary maneuvering by fork trucks, are available from Swing-Shift Mfg. Co. The forks are shipped complete and are said to be easy to install. They permit fork trucks to operate in tight spaces, narrow aisles and sharp corners, and can be installed on almost any make truck.

Circle 242 for more information

### Lightweight Vibrating Conveyor



A lightweight mechanical vibrating conveyor has been added to the line of The Jeffrey Manufacturing Company. Said the meet the growing demand for inexpensive, dependable and low maintenance conveyor, the new unit is

# Processing costs too high?

### Send for this FREE catalog

Cyclone Metal Conveyor Belts are working wonders—cutting processing costs, speeding operations, increasing product output. They are flexible—open meshed—sanitary—immersible in water, oils, chemicals—temperature resistant. Cyclone Belts come in several basic styles and in carbon, alloy and stainless steels. There are many mesh and wire sizes available together with various accessories.

This big, 32-page catalog will show you the extremely wide scope of Cyclone Belts—the most complete line of wire mesh processing belts now available. There are actual pictures of many applications. See why Cyclone Belts can do your particular job so well.

#### CYCLONE FENCE DEPARTMENT

AMERICAN STEEL & WIRE DIVISION, UNITED STATES STEEL CORPORATION  
WAUKEGAN, ILLINOIS  
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

#### MAIL THIS COUPON

Cyclone Fence, Dept. A-125  
Waukegan, Illinois

Please send me your big, illustrated Catalog #5. No charge or obligation.

Name \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_

**USS CYCLONE**  
**METAL**  
**CONVEYOR BELTS**  
SPIRAL WOVEN  
FLAT WIRE • FLEX-GRID



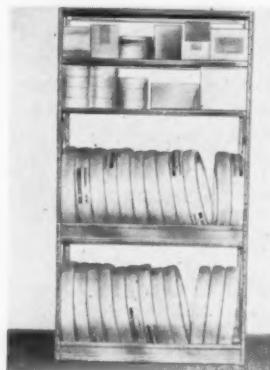
UNITED STATES STEEL

Circle No. 13 on Reader Service Card for more information

called the LMV and is built in 12 foot sections. Deck widths from five inches to 24 inches are offered, and sections may be cut to obtain any odd length. Maximum height from floor is 14 inches, and maximum speed is 45 hpt. Among features pointed out are compact design, simple installation and operation, and ability to handle a wide range of materials.

Circle 243 for more information

### Higher Stacking of Bulky Items



Higher and more orderly stacking of miscellaneous bulky materials is possible with this adjustable, portable rack, claims The Frick-Gallagher Manufacturing Co. Designed to increase the capacity of present storage areas, the all-steel racks have a capacity of 1300 pounds at each rack level. Shelves have 300 pounds capacity, and, together with supporting rails are adjustable in height on two inch centers. Racks are 48 inches wide and 18 inches deep.

Circle 244 for more information

### CESCO'S TOTE-SHOP BOXES

DO YOUR ROUGH/TOUGH JOB  
EFFICIENTLY-EASILY-ECONOMICALLY  
on Conveyors • Pallets • Hand Trucks  
Skid Platforms or what have you



STACK  
SECURELY,  
CONVENIENTLY!

Solve your Storage and Handling Problems with our Tote Boxes, Trays and Pallets. Write today for quotations on special sizes. Special Marking Facilities, for identification purposes, are available in various colors and numbers. Please submit detailed specifications.



#### Model # WB—Wood Bottom (Illus.)

STANDARD SIZES AVAILABLE FROM STOCK

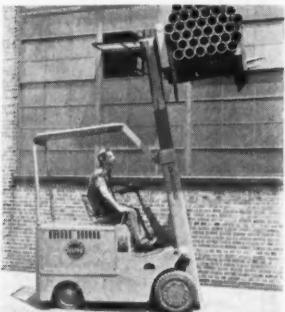
Model	Size	Length	Width	Depth	Weight
WB-1	I. D.	14 $\frac{1}{8}$ "	11 $\frac{1}{4}$ "	9"	11 $\frac{1}{4}$ lbs.
WB-2	I. D.	18"	11 $\frac{1}{4}$ "	9"	13 lbs.
WB-3	I. D.	20"	11 $\frac{1}{4}$ "	9"	14 lbs.

**CESCO CONTAINER CO.**  
Factory: NORTHAMPTON, MASS.

General Offices:  
Dept. (F) 475 Fifth Ave., New York 17, N.Y.

Circle No. 31 on Reader Service Card

## Highly Maneuverable Fork Truck

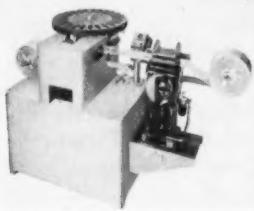


Baker-Raulang Company has introduced a new line of electric fork trucks designed especially for high maneuverability, ease of maintenance, and increased operator comfort and convenience. Capacities of 3000-, 4000- and 6000-pounds are available in the new Model FT line.

Features include absence of a cowl, three braking systems, maximum accessibility of component parts, and automatic-type steering column.

Circle 245 for more information

## Packaging Machine Prints Too



Manufacturers can now imprint trademark, product description, control number, etc. on packages while they are being simultaneously formed, filled and heat sealed. A new model Pak-Rapid, Inc.

machine, equipped with a Markem Model 70AI printing unit, does the printing while the machine forms flexible two-dimensional packages around products at rates up to 3600 per hour. A wide variety of both uniform and irregular shaped items can be handled without change or adjustment of feed.

Circle 246 for more information

## Gives Polyethylene "Slip"



To prevent polyethylene surfaces from sticking together and to give them the needed "slip" in the making of bags and wraps, a new powder-spray attachment for bag-making machines and flexographic presses has been manufac-

tured by H & H Products. Said to be easily installed on any polyethylene bag-making machine and printing press, the unit sprays special powder onto the polyethylene through three, six or nine, adjustable nozzles providing either partial or full area coverage. All nozzles are independent of each other so each nozzle can be placed where it is needed. Having no moving parts, the unit requires only two to twelve pounds of air for either continuous or intermittent operation.

Circle 247 for more information



For "Traffic Volume—Minimum Maintenance—Minimum Closing Time"

## install RUBBAIR DOORS!

Tileston and Hollingsworth Company, one of New England's oldest and most famous papermakers, wrote us a letter, saying in part—

"The doors were installed in our Machine Room, where traffic moves twenty-four hours a day, six days a week. Trucks are continually smashing into the doors, as rolls are moved from the paper machines into the finishing area. The doors have given almost trouble-free operation since installation. The Rubbair Door operates faster than any other we have used."

Rubbair Doors speed handling, reduce repairs, protect loads wherever doors must be hung in an industrial operation.

Check these advantages:

- Improved insulation
- Reduced noise, industrial fatigue, injuries to personnel
- Protection from damage to trucks, pallets and loads
- Speedier handling of materials
- Greatly lowered maintenance costs

For complete information write Dept. F.

**Stic-Klip®** Rubbair Door Division  
**MANUFACTURING CO., INC.**

50 Regent St., Cambridge 40, Mass.

Circle 135 on Reader Service Card for more information

## NEW EQUIPMENT SECTION

### Hauls, Switches, Spots



Whiting Corporation has available a new heavy-duty Trackmobile that hauls, switches and spots railroad cars. It operates on both road and track, with the conversion from road to steel rail wheels requiring only

90 seconds. All controls, including those for positioning, raising and lowering wheels, coupling and uncoupling, are located in the cab. The cab is elevated and enclosed in glass to provide 360 degree visibility and all-weather operation.

Circle 248 for more information

### High-Speed Bale Sealer



An automatic high speed bale sealer, specifically designed for handling, gluing and sealing paper shipping bales up to 100 pounds weight has been intro-

duced by the J. L. Ferguson Co. The new machine can be factory customized to practically any bale size and production requirement, the company claims. Although the machine was designed originally for handling and sealing 100-pound bales of asbestos, numerous other applications are now being adopted.

Circle 249 for more information

### Redesigned Hand Trucks



An important design refinement on 17 sizes and models of its all-steel two-wheel hand truck line has been announced by The American Pulley Company. Previously of bolted construction, the trucks are now being manufactured as complete welded units, giving a smoother, more rigid unit. Wheel sizes and axle locations have been changed in some mod-

els to provide better balanced, easier-rolling trucks, and making it easier to "break" loaded trucks.

Circle 250 for more information

## 'ever Investigate? . . .

**CRANE  
MODERN-  
IZATION  
INSTEAD OF  
REPLACE-  
MENT**

A good crane is capable of many years of service. When it does show serious signs of wear it can often be rebuilt and modernized in the process at a considerable saving under the price of a new crane.

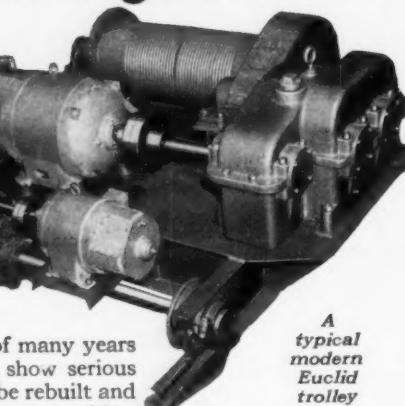
Crane bridges rarely require replacement and the installation of a new trolley can provide the very latest developments and most efficient features of operation.

The advice of our engineers in such matters is available without obligation. Write for the new Euclid Catalog and call upon us if we can be of service.

**Euclid Cranes**

The EUCLID CRANE & HOIST CO.

1367 CHARDON ROAD  
CLEVELAND 17, OHIO



A typical modern Euclid trolley

## NEW LONDON "Cost Cutter" CONVEYORS

Light • Low Cost • Versatile  
for . . .  
**BOXES, BAGS,  
BUNDLES,  
BALES**

14' ALUMINUM  
MODEL SHOWN

**\$484**

OTHERS FROM

**\$377**

Electric or  
gasoline drive.  
Other flat and  
through belt  
conveyors for  
inclined or  
horizontal  
applications.

Write for  
Catalog

NEW LONDON ENGINEERING CO.

New London, Dept. F, Wisconsin

Circle No. 55 on Reader Service Card for more information

Circle 112 on Reader Service Card

FLOW

## Small Gearmotors Offer Eight Ratios

A new line of small gearmotors is offered by Doerr Electric Corporation in eight standard ratios from 5:1 to 60:1 with 1/20 and 1/12 HP ratings. Motors can be split phase, capacitor start-induction run, capacitor start-capacitor run and polyphase. Open and totally enclosed constructions are available.

Circle 251 for more information

## Die-Cut Stencil



machine for printing actual labels or with Weber handprinters for imprinting facimiles of the labels directly on shipping containers. Stencils are supplied already cut to print the constant or standard information. Variable information is then filled-in on a typewriter or by hand with a stylus just before using.

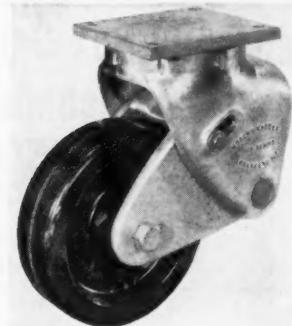
Circle 252 for more information

## UL Approved LPG Trucks

Yale & Towne Mfg. Co. has announced full Underwriter's Laboratories approval protection on its LPG powered KG-51 and G-52 series of trucks from 2000 to 10,000-pounds capacity. The G-52 series has also been approved for insured usage with the three different ICC containers.

Circle 253 for more information

## Caster Prevents Shock



The series 39 caster is designed for full range shock prevention with a 2500 pound operational load, says Modern Caster Company. The eight inch Duoflex caster has a Westinghouse Micarta wheel and sealed Timken bearings. In operation, the caster prevents operational shock in excess of one gravity from being developed in the horizontal, lateral and vertical planes throughout the entire suspension system loading range when towed or manually pushed over sharp or hard obstacles more than one-half inch high or deep.

Circle 254 for more information

## Is this your crane operator?



It might well be, if he lifts heavy loads by sheer guesswork — that is, without a

## MARTIN-DECKER CRANE WEIGHT INDICATOR

The SB-10 Crane Weight Indicator warns your operator of an excessive load before he actually lifts it. Stops overtaxing equipment. Prevents costly accidents.

Merely by glancing at a dial a few inches from his controls, your operator instantly knows the weight, the boom radius, and the lifting capacity. He can tally weights while he's loading.

There are models for all crane capacities. For further information write Martin-Decker Corp., 3431 Cherry Ave., Long Beach 7, Calif., Dept. N-10.



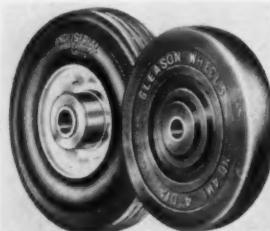
The Martin-Decker SB-10 Crane Weight Indicator tells you (1) the weight you are lifting, (2) the boom radius, and (3) the lifting capacity at that radius.

OTHER MARTIN-DECKER MATERIALS-HANDLING INSTRUMENTS	LIFT TRUCK SCALE makes any hydraulic cylinder-type lift truck a scale, assures full safe load.	J-701 TENSIMETER unitized instrument, used as traction dynamometer, suspension scale, etc.	STANDARD TENSION INDICATOR used as dynamometer or for equalizing strain on cables, wires, etc.
S-5 CRANE WEIGHT INDICATOR — small, low cost, remote reading, for use on all types of cranes.	SU-20 SENSATER friction free. Rugged.	J-702 TENSIMETER remote indicating dynamometer, suspension scale, cable strain equalizer, etc.	HEAVY-DUTY TENSION INDICATOR for use on $\frac{3}{4}$ to $1\frac{1}{2}$ inches and cables; has 200,000-lb. capacity.
<b>MARTIN-DECKER CORP.</b> HOME OF THE WEIGHT INDICATOR — LONG BEACH, CALIFORNIA			

Circle No. 103 on Reader Service Card for more information

## NEW EQUIPMENT SECTION

### Medium and Heavy Duty Wheels



wheel types and four different sizes. Solid rubber wheels are available with soft or hard tread.

Circle 255 for more information

A complete line of medium and heavy duty wheels for industrial applications has been announced by the Gleason Corporation. Steel disc, semi-pneumatic wheels are offered in seven different

### New Personnel Carrier



Lewis-Shepard Products, Inc. has introduced a new electric Personnel Carrier said to be ideal for plant tours or intraplant movement. Capacity of the truck is 2000 pounds; deck dimensions are 54 inches

long by 40 inches wide, with an underclearance of 9½ inches. Maximum speed is 6 mph. Four removable air cushion seats are furnished for plant tours, and the operator can stand or sit on the battery compartment.

Circle 256 for more information

### Heavy Duty Freight Truck



A heavy duty freight truck designed specifically for handling in terminals, docks, warehouses and freight carrier operations is offered by Hamilton Caster & Mfg. Co. The hand truck combines compactness with heavy duty construction for applications where rugged service is required and where various sizes and shapes must be carried. Construction is of

hardwood and steel; load capacities 1000- to 1800-pounds. Two additional vertical center straps extending up to an extra cross strap at the top increase efficiency in handling the various shapes and sizes.

Circle 257 for more information

**Trojan**  
TRACTOR  
for POWER TRAVEL

Proven Money Saver In Hundreds of Instances.  
Ask for Trojan Tractor Bulletin 810.

Make your hand pushed hoists and cranes power traveled. Eliminate slow pulling and pushing drudgery. Speed up handling, save time, increase production, reduce costs. Simply attach a Trojan Tractor; inexpensive, quick delivery. Order one today.

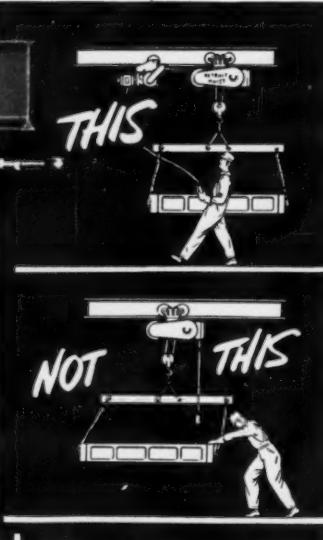
#### DETROIT HOIST & MACHINE CO.

8210 Morrow St., Detroit 11, Mich.  
Hoist, Crane & Tractor Designers & Manufacturers

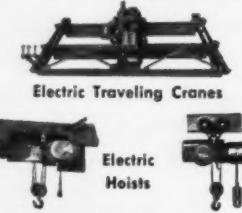
Since 1905

Circle No. 45 on Reader Service Card for more information

150



- Also ask for the Detroit Hoist & Machine Co. New General Catalog 795



### NOLAN ONE-MAN CAR DOOR OPENER



Opens Any Box Car Door in 20 Seconds or Less! \$37.50 EACH

FREE LITERATURE  
F.O.B. NOLAN CO., BOWERSTON, OHIO

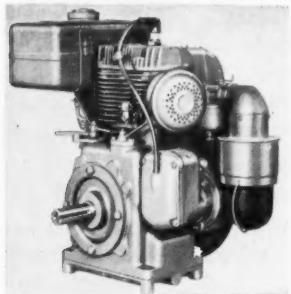
THE NOLAN COMPANY  
110 Pennsylvania Street, Bowerston, Ohio  
Please send  ONE MAN CAR DOOR OPENER at \$37.50  
 FREE LITERATURE

NAME .....

ADDRESS .....

CITY ..... ZONE ..... STATE .....  
Circle 113 on Reader Service Card  
FLOW

## More Powerful Engine



Model ACN 4-cycle heavy-duty engine delivering from 2.3 to 5.6 hp is available from Wisconsin Motor Corporation. Smallest engine in a current series of 12 models, it represents an increase in maximum horsepower over the single cylinder Model ABN.

Circle 258 for more information

## Reversing Transmission Speeds Operation

A reversing transmission recently introduced by Sherman Products, Inc. for use on Ford tractors is said to add new convenience and speed in operations where reverse speed is as important as forward speed. By providing for five forward and five reverse speeds, the unit enables fast shuttle operations of the tractor for maneuvering into position or working with front-end equipment.

Circle 259 for more information

## Light, Powerful Hoists



Two light, powerful coil chain ratchet lever hoists are offered by Coffing Hoist Division of the Duff-Norton Company. Reduction in the hoists is achieved through specially-designed compound levers instead of gears, said to offer more efficiency, lighter weight and compactness, plus a higher safety factor.

Called Models L-1½ and LD-3, the hoists are available in either malleable iron or aluminum alloy. They are tested at 100 percent above capacity and can be easily disassembled in the field for fast, efficient servicing, according to the manufacturer.

Circle 260 for more information

## Shorter End Mounted Motors



This new line of shorter round frame, flange mounted motors will replace the old design in the one to 15 hp range according to Century Electric Co. They feature short length, light weight and better performance and are available in open type frame or enclosed fan cooled type.

Circle 261 for more information

DECEMBER, 1955

## FROM IDEA . . .



## TO FINISHED INSTALLATION



**Service**  
AUTOMATED EQUIPMENT

## ENGINEERED FOR YOUR SPECIFIC REQUIREMENTS

Most of America's leading manufacturers are well aware of the many advantages of automation. The question is no longer "Should we automate?"—competitive market conditions have answered that! The problem now becomes, "To what extent is it practical and profitable to automate—and how far should we go now?"

The Service Conveyor Company can help you determine the solution to this problem—a solution that will meet all your operating and cost requirements. Drawing upon its twenty-five years of experience in the field of practical automation, Service can plan, design, engineer, build and install the *right* automated facilities and equipment for your plant!

Service—engineered automation does not mean installing *all* new equipment. Service utilizes your existing facilities—supplementing them with the additional equipment required—to achieve continuous, integrated production flow. Discuss your automation plans in complete confidence with a Service engineer. Write for full details today!



**SERVICE CONVEYOR CO.**

7764 BRYDEN AVENUE  
DETROIT 10, MICHIGAN  
DEPT. 312

**Engineered Automation—Ideas, Methods and Experience**

Circle 128 on Reader Service Card for more information

## NEW EQUIPMENT SECTION

### Handles Double-Face Pallets



Designed for simplified handling of materials in double-face pallet systems is this new 4000 pound capacity hydraulic lift truck. Called the Model 4M-20 Turnabout, the truck features an overload by-pass safety valve which prevents

overloading, interchangeable forks, "no drop" handle that stays in place in any position, smooth hydraulic lifting and lowering, and high maneuverability. Made by Rack Hydraulic Co.

**Circle 262 for more information**

### Cuts Yard Handling Time

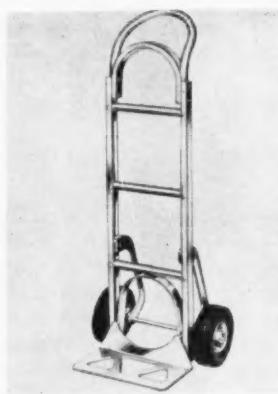


This 30 foot long portable yard ramp is believed by its manufacturer, Magcoa Limited, to be the largest piece of magnesium equipment ever fabri-

cated in Canada. The ramp has a capacity of 10,000 pounds, and is expected to cut in half the time required for many yard handling operations. Wheels located beneath the midpoint of the ramp and a manually operated lifting device permit one man to move and position the 1531 pound unit.

**Circle 263 for more information**

### Moves Material Faster



More material can be moved faster with this lightweight magnesium hand truck, claims Milwaukee Truck Company, saving hours and dollars in handling time and cost. Called the Load Floater, it is said to be particularly suitable for use on delivery trucks. It has a 45½ inch loading height, 7 inch by 14 inch nose plate, and U-shaped handle for hanging when not in use. Built-in stair climbers ease the truck up and down stairs, and the narrow overall width allows easy maneuvering in congested areas.

**Circle 264 for more information**

## WISCONSIN-POWERED



**Lowther Scooter  
Carries 1000 lb.  
Payloads**

**GETS  
THERE!  
FAST!**

Here is a lively, versatile, hard-working unit for plant, warehouse or yard service . . . handling loads up to 1000 lbs., at speeds up to 26 miles per hour under full load and 32 M. P. H. without load.

Harry A. Lowther Co., Joliet, Ill., builders of the Lowther Scooter, selected a Model AEN Wisconsin HEAVY-DUTY Single Cylinder Engine as the most dependable power unit for powering this equipment. The scooter is constructed along conventional automotive lines, with automobile differential, drive shaft, clutch and 3-speed transmission which enables it to negotiate steep ramps under load. The Model AEN is also available with electric starter and generator.

Because of their heavy-duty design and inherent Lugging Power, Wisconsin Engines are ideally adapted to a great variety of material handling equipment, including fork lift trucks, platform trucks, portable elevators and loaders, etc.

YOU can't do better than to specify "Wisconsin Power" for your equipment.



**WISCONSIN MOTOR CORPORATION**

World's Largest Builders of Heavy-Duty Air-Cooled Engines  
MILWAUKEE 46, WISCONSIN

**Circle No. 159 on Reader Service Card for more information**

**Ready Soon . . .  
Order Now . . .  
The 1956-57  
FLOW Directory**

**FLOW DIRECTORY**  
1240 Ontario St. • Cleveland 13, Ohio

Send me ( ) copy(ies) of the 1956-57 FLOW DIRECTORY as soon as it is available at \$6.50 a copy.

Check enclosed ( ) Bill me ( )  
Bill my company (Order No. )

Please make checks payable to FLOW DIRECTORY. Ohio sales—add 3%.

Name .....

Company .....

City ..... State .....

**FLOW**

## Modified Pallet Truck

A hydraulic pallet truck which has been modified to suit the needs of a piece rate worker handling light loads is available from The Yale & Towne Manufacturing Co. Built to take loads up to 1000 pounds, the new model features faster lifting speeds, and will handle single or double faced pallets.

Circle 265 for more information

## Tandem Axle Trailer Dump



This tandem axle trailer dump was designed by Galion All-Steel Body Company for use with tandem rear axle tractors. Designated Model TTM Transporter, it is said to be ideal for use in areas where highway weight laws allow maximum credit for two tandem axles. Available in body lengths of

19- to 24-feet, capacities from 10- to 36-cubic yards.

Circle 266 for more information

## Industrial Gear Pumps

Here's a new line of standard industrial hydraulic pumps, available for use on fork trucks, front end loaders, road graders and associated equipment. Use of standardized parts and single body casting for different pumps is said by Pesco Products Division to make possible low purchase price.

Circle 267 for more information

## Automatic Sacker

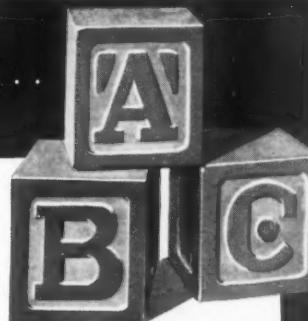


Constant supervision of weighing and packaging is unnecessary with this automatic sacker claims Blaw-Knox Co., Dairy Equipment Division. It is available in units of from two sackers, up to as many as may be required to handle end-product delivery. Material is conveyed by a cadmium plated screw over discharge ports which are manually opened by the operator as the container is set in place on the scales. Scale beams are adjustable for weight of container and net weight of material to be discharged. When exact amount has been discharged from the stainless steel conveyor trough, a magnetic mercury switch trips a relay which activates a solenoid, automatically closing the discharge port with a spring-loaded gate.

Circle 268 for more information

DECEMBER, 1955

as basic as . . .



Now you  
can buy

CUSTOMIZED conveyors  
in pre-fabricated  
STANDARD sections

Sections can be assembled to form virtually any type of hinged-steel belt conveyor for handling stampings, formed metal parts, forgings, automotive scrap, chips and turnings and many other miscellaneous products.

Straight sections . . . concave or convex curved sections . . . take-up charge sections and discharge-end sections can be furnished to meet specific requirements of belt width as well as load bearing and volume capacities.

Conveyors can be lengthened, shortened or modified in almost any way at minimum downtime and cost.

MAY-FRAN . . . a name long recognized in the materials handling field . . . is first again with standardized components for your customized installation.



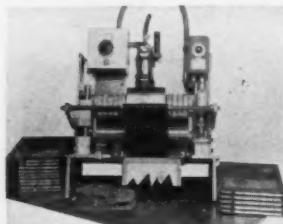
1611 Clarkstone Road • Cleveland 12, Ohio

627-4870

Circle No. 105 on Reader Service Card for more information

## NEW EQUIPMENT SECTION

### Box End Coder



A machine for imprinting codes and product information on flat box ends to distinctly aid identification and inventory has been developed by the Industrial Marking Equipment Co. The box end printer operates at a speed of 30 impressions per minute, utilizing a heat transfer dye process. Complete with built-in set of numbers and letters in several colors.

Circle 269 for more information

### Improved Sound in Mobile Radio



Motorola Communications & Electronics, Inc. has introduced the Twin-V radiophone which is said to incorporate the new look and improved sound in mobile radio equipment. Emphasis is

placed on the importance of universal operation from either a 6- or 12-volt battery, and major innovations improving receiver sensitivity, noise suppression and voice frequency reproduction have been incorporated in the new units.

Circle 270 for more information

### Compact Barrel Dumper



A new and compact barrel dumper, designed specifically for handling, hoisting and dumping barrels, kegs and drums, is available from Uhrden, Inc. Called Tubalift Model TD-1, the unit is engineered for speed, stability, efficiency and safety. Manufactured with electrical or manual lifts, the unit has a capacity of 1000 pounds. Outstanding features include twin hydraulic cylinders and heavy duty chains, and safety in handling.

Circle 271 for more information

## Keep Your Product on the move

with  
**ASHWORTH**

**Process  
Belts**

WOVEN WIRE and

FLAT WIRE DESIGNS

Bright or galvanized steel

Corrosion resistant stainless

Chrome nickel alloys for high temperature

Ashworth Metal Belts permit the combination of product processing and material flow.

**ASHWORTH BROS., INC.**  
WINCHESTER, VIRGINIA

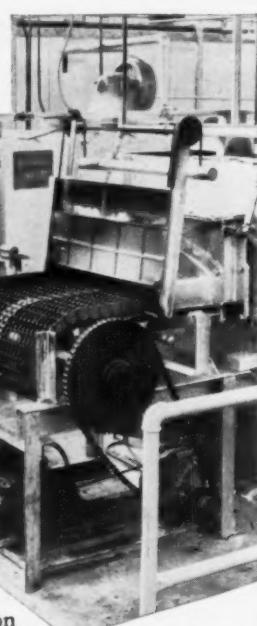
Sales

Engineers:

Atlanta • Buffalo • Charlotte, N.C. • Chicago • Cleveland • Dallas • Detroit  
Greenville, S.C. • Los Angeles • Louisville • New York • Philadelphia • Rochester  
Seattle • St. Louis • St. Paul • Canadian Rep., PECKOVER'S LTD., Toronto • Montreal

Circle No. 11 on Reader Service Card for more information

154



WRITE FOR  
ILLUSTRATED CATALOG  
F 55



**FREE  
54 PAGE  
CATALOG**  
**DeLuxe**  
**STEEL SHELVING**  
*...and*  
**FACTORY FURNITURE**



**WRITE FOR  
YOUR COPY  
TODAY!**

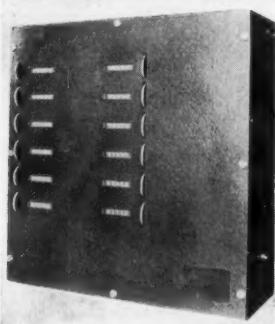
**DELUXE METAL FURNITURE CO.**

300 Struthers St., **WARREN, PA.**

Circle No. 42 on Reader Service Card

**FLOW**

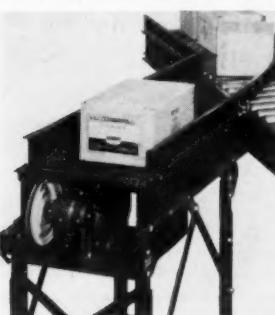
## Converts Weight Readings



Here's a remotely controlled totalizer that can be used with any industrial dial scale to convert weight readings to digital equivalents. Richardson Scale Company says the unit is for use as a control in receiving or shipping or processing material through an automatic hopper scale connected to a dial scale.

Circle 272 for more information

## Live Roller Junction



This live roller conveyor junction unit was designed by the Rapids-Standard Company, Inc. to transfer materials to or from live roller conveyor. The unit consists of straight live section and spur which angles into straight section at  $37\frac{1}{2}$  degrees. Powered by right angle gear-head motor.

Circle 273 for more information

## Colored Sealing Tapes

Standard quality Trojan Imperial brand sealing tapes are now available in blue, red, green and gray, in addition to the traditional natural and golden brown shades. Increasing demand from manufacturers, warehousemen and distributors of merchandise of all kinds for an easy method of identifying cartons was given as the major reason for the addition of the four contrasting colors by The Gummed Products Co. At present, the Trojan Color Tapes will be available in sixty-pound weight only.

Circle 274 for more information

## Variable Speed Pulley



This  $\frac{3}{4}$  hp variable speed pulley which can be readily adapted to new or old equipment is said by Lovejoy Flexible Coupling Company to be low cost. Use of a minimum number of parts and simplicity of design are listed as important factors in reducing upkeep and maintenance. Speed ratio is 3-2/4 to 1; weight 6-1/2 pounds.

Circle 275 for more information

DECEMBER, 1955



# Push-Button POWER LIFTS DANGEROUS "STRAIN LOADS"

Keller's new 86A-1 Air Hoist provides the safe way to handle loads up to 150 lb. Prevents strains and injured backs, yet it is as natural as lifting by hand.

These features afford safer, simpler material handling:

- ✓ One hand control raises or lowers at any speed from 0 to 40 feet per minute.
- ✓ Load is free to rotate or swing in any direction as desired by the operator.
- ✓ Air hose is coiled around the supporting cable where it cannot interfere. No dangling chain.
- ✓ Continuous service...air motor cannot burn out from overload or prolonged use.

CAPACITY: 150 lb; WEIGHT: 14 lb;  
LIFT: 9 ft; SPEED: 40 fpm.  
Send for Catalog 86A.

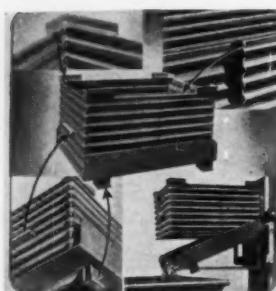


**KELLER TOOL**  
DIVISION OF **GARDNER-DENVER**  
GRAND HAVEN, MICH.

Circle No. 89 on Reader Service Card for more information

## NEW EQUIPMENT SECTION

### All-Steel Drop Bottom Box



Palmer-Shile Company is marketing a new line of corrugated all-steel welded drop bottom boxes designed for use either with positioning stand or for controlled dumping by fork truck. When used on a positioning stand, the legs at the bottom of the box engage the stand and the drop bottom automatically opens to discharge materials into the stand tray. When used for automatic dumping by fork truck, a reinforced box hanger engages the mast of the truck for controlled discharge. Boxes have four-way entry and are built from any gauge steel to customer dimension and capacity specifications.

Circle 276 for more information

### Fiberboard Fights High Humidity

A fiberboard, called HH Corrugating Medium, especially processed to fortify containers against destruc-

tive wilt caused by high humidity has been introduced by Mead Board Sales, Inc. HH (High Humidity) board is said to be both odorless and nontoxic, without foreign substance to contaminate container contents or render waste unusable.

Circle 277 for more information

### New Hydraulic Crane



Bucyrus-Erie Company's new all-hydraulic H-5 Hydro-crane is said to be extremely maneuverable and mobile. Available as a  $\frac{1}{2}$  cubic yard excavator and as a 9-ton lifting crane, the unit is designed for mounting on conventional motor truck. It has an 18,000 pound maximum lift and can be equipped with a stand-

ard two-piece boom or optional high-lift three-piece boom. Its comparatively short tall swing is advantageous for close-quarter work, according to the manufacturer. Numerous safety features have been incorporated in the unit.

Circle 278 for more information

## BUILD IT YOURSELF

Save time, shipping and labor. Build this factory quality crane,  $\frac{1}{2}$  to 5 ton capacity



### CONCO UNDERHUNG AND TOP RUNNING HAND GEARED CRANE ASSEMBLIES

#### BUILD IT YOURSELF:

Packages include instructions, complete parts except locally available I-beam and cross shaft. Equip with Conco chain or electric hoist.

Write for Bulletins 2200 and 2300 and name of local distributor.



### CONCO ENGINEERING WORKS

Division of H. D. Conkey & Company, 38 Grove St., Mendota, Ill.

Affiliates: Conco Engineering Works—Domestic Heating Equipment  
Conco Building Products, Inc.—Brick, Tile, Stone

Circle No. 37 on Reader Service Card for more information



CONCO UNDERHUNG CRANE ASSEMBLY

Ready Soon . . .

Order Now . . .

The 1956-57

FLOW Directory

#### FLOW DIRECTORY

1240 Ontario St. • Cleveland 13, Ohio

Send me ( ) copy(ies) of the 1956-57 FLOW DIRECTORY as soon as it is available at \$6.50 a copy.

Check enclosed ( ) Bill me ( )  
Bill my company (Order No. )

Please make checks payable to FLOW DIRECTORY. Ohio sales—add 3%

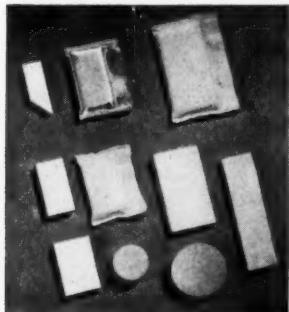
Name \_\_\_\_\_

Company \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_

FLOW

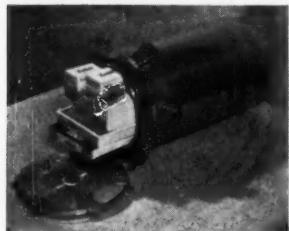
## Cushioning For Any Job



also be made to suit any required specifications. Flat cushioning parts may be die-cut in rectangular, circular or irregular shapes, cubes, doughnuts, circles.

Circle 279 for more information

## Near-Perfect Moisture Barrier



In search for better packaging of its own electronic devices Lavoie Laboratories produced the "Humid-Trol" preserving container. Tests of all types of rubber, plastics and similar materials led to a new material that is

the secret of the success of the container. The design of the simple but effective joint and container, plus the new material resulted in a near-perfect moisture barrier which has withstood countless tests. Manufacturer reports that it has been put through, and withstood, every conceivable condition, including severe thermal shock.

Circle 280 for more information

## Tray Truck Multiplies Handling

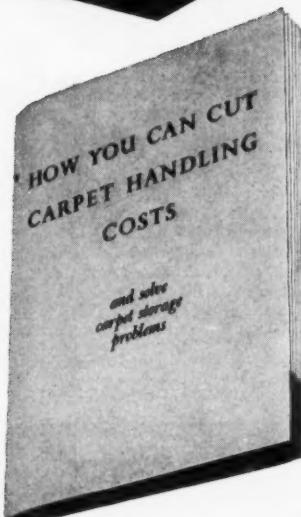


Circle 281 for more information

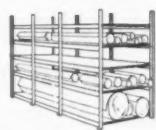
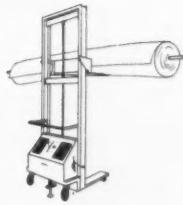
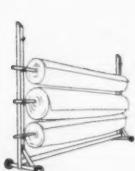
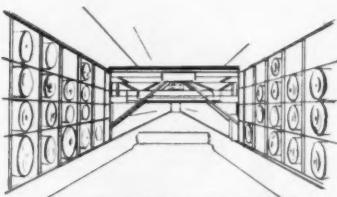
Heavy duty Tray-Tier trucks are described by Lloyd Engineering Company as multiplying the handling of work in progress. As many as nine individually removable trays may be furnished on the rubber tired, ball bearing units. The two-wheel hand trucks are also said to conserve floor space and eliminate obstructed aisles.

# CARPET HANDLING PROBLEMS SOLVED!

This Booklet  
Tells All!



Complete portable or permanent type systems installed to fit all requirements.



### SEND FOR FREE COPY TODAY

THE ROBERTS CO., Dept. F.L.—512  
1536 N. Indiana St., Los Angeles 54, Calif.  
Please send my free copy of "How You Can Cut Carpet Handling Costs."

Individual \_\_\_\_\_

Firm Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_



Circle No. 50 on Reader Service Card for more information

## NEW EQUIPMENT SECTION

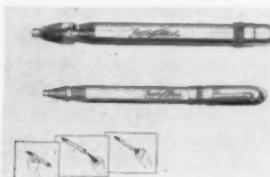
### Portable Boosters



Power driven portable boosters in lengths from 15- to 30-feet and belt widths up to 30-inches have been introduced by Sage Equipment Company, Inc. Designated Models PS-1 and PS-2, the units are manufactured with full length control bar and the belt conveyor can be run forward and reverse. Electric gear head motors ranging from 1/3 to 1 hp may be supplied. The units are said to be excellent for stacking boxes, cartons, bags.

Circle 282 for more information

### Soil-Proof Markers

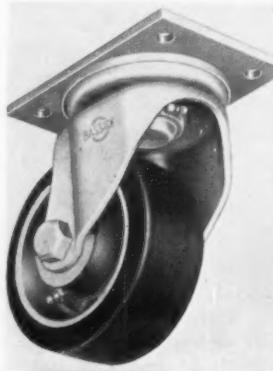


Packaging, labeling and equipment marking can now be done without danger of soiling either the writing surface or the user's hands or clothing, claims Feather Mark

Products Company. Feather-Mark Markets are said to be the first marking pens which make it impossible for ink to run onto the gripping surface, regardless of how frequently the pen is filled. The pen comes in two sizes, the Automatic for heavy use, and the Artful, a pocket-clip model. A choice of standard color inks and felt tips is available.

Circle 283 for more information

### Fully Sealed Casters



Heavy duty S99 series casters manufactured by The Bassick Company now offer the extra feature of complete sealing to prevent loss of lubricant and entry for foreign matter. Three new design features provide this protection. A baffle ring protects swivel bearings from dirt and water; grease retainer prevents swivel lubricant loss through vertical leakage; and wheel bearing seal keeps foreign matter outside, grease inside.

Circle 284 for more information



### *Do you KNOW when protective maintenance is needed?*

There's a RIGHT TIME for protective maintenance . . . and the HOBBS HOUR METER tells you when. Lift trucks and other powered equipment are subject to less down-time and last longer when maintenance is done ON TIME.

#### Not a Revolution Counter

This electric timing instrument shows HOURS and MINUTES of engine operation. No revolution counter can provide the accuracy needed for genuinely effective on-time maintenance.

#### Approved by Leading Manufacturers

Installed as original equipment or recommended as approved accessory by leading materials handling equipment manufacturers. Ruggedly built. Easy to install. Low in price. See your factory branch, representative or distributor . . . or WRITE:

**John W. Hobbs Corporation**  
2061 YALE BLVD. SPRINGFIELD, ILLINOIS  
World's Largest Builders of Running Time Meters

Circle No. 77 on Reader Service Card for more information



### HOBBS Engine Hour METERS

Pointer type illustrated;  
now available also in  
direct-reading models.



### RUBBER ROLLERS FOR CONVEYORS

- Provide cushioned, scratch free rides
- Suitable for finished stampings, glass, plexiglass, etc.
- Used for die lifters, hydromatic welders, gravity roll conveyors, etc.

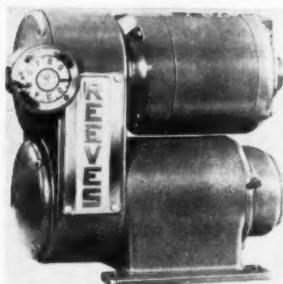
FIVE MODELS — THREE DENSITIES  
4" DIA.—2" WIDE 2½" DIA.—2" WIDE

DUAL BALL BEARING ALLOY AXLE—  
SELF LOCKING NUT  
ALL PARTS INTERCHANGEABLE  
WRITE FOR FURTHER INFORMATION

**STILSON TOOL, INC.**  
30229 GROESBECK HWY.  
Ph. Prescott 8-2010, Roseville, Mich.

Circle No. 163 on Reader Service Card

### Compact Drive Unit



A 20 percent saving in space over the previous design, permitting wider application, is claimed by Reeves Pulley Co. for the No. 100 series Vari-Speed Motodrive. The 1 hp variable speed unit occupies a maximum space of 16-5/16" by 21-1/2" by 11-1/2" in vertical models. As many as 112 different assemblies are available in speed ranges from 2:1 through 8:1.

Circle 285 for more information

### Pocket-Size Marking Pen

A felt-tip marking pen which is said to hold more ink than any other pocket-size marking pen uses ink in any of five colors, black, red, green, blue and yellow. Manufactured by Carter's Ink Co. and called the Carter Marker, it is equipped with a standard fountain pen pocket clip. An automatic leak-proof valve prevents the pen from oozing ink when it is carried in the pocket or when lying on a table. Both bullet point and chisel point felt-tips are available.

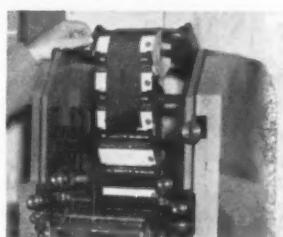
Circle 286 for more information

### Electric Label Dispenser

Avery Adhesive Label Corp. has an electric label dispenser that feeds pressure-sensitive labels the instant they're needed. Called the Avery Label Dispenser "55" it is expected to trim labor costs and increase production in hundreds of varied labeling operations. To operate, it is only necessary to take a label from the mouth of the dispenser . . . another label rolls out automatically, ready for instant application. The dispenser will dispense one label at a time, or several.

Circle 287 for more information

### Roll Label Machine



High speed labeling of books and packages is the forte of this Potdevin Roll Label Machine. It applies glue and dispenses an individual label to an operator from preformed label roll stock.

Circle 288 for more information

**STANDARD NESTIER BOXES and BASKETS FOR SPECIAL JOBS**

Nestiers are mass produced in three standard sizes. They nest to save space. Filled, they tier with contents of each unit visible and accessible.

We guarantee that replacement with Nestiers will reduce your handling costs regardless of whether you transport small parts by hand, pallet or conveyor.

**NEFF & FRY**  
**BINS ARE DRY INSIDE**

**THE NEFF & FRY CO. • 110 Elm St. • Camden, Ohio**

**SUPER-CONCRETE STAVE STORAGE BINS**

Circle 111 on Reader Service Card for more information

THE CHAS. WM. DOEPKE MFG. CO., INC.  
8836 BLUE ASH ROAD, ROSSMOYNE, OHIO  
Circle No. 48 on Reader Service Card  
DECEMBER, 1955

When we erected 17 bins for Johns-Mansville Corporation at Fort Worth, one specification was that the bins must show no signs of leakage or dampness after testing with direct impact of water through a standard fire hose nozzle. The bins are used for handling and storing slate granules of various colors for roof coverings.

"The photograph indicates the water resistance of your bin

which was tested in a most rigorous manner," wrote L. A. Benton, Johns-Mansville Project Engineer. "The installation has been very satisfactory."

No matter what kind of flowable bulk materials you use, you'll exercise good judgment by selecting our bins. Better ask for our folder, "Bins With the Strength of Pillars."

Circle 111 on Reader Service Card for more information

Circle No. 27 on Reader Service Card for more information



"with the tire that won't roll off"

For your every industrial need there is a Bronco Wheel designed to fit the requirements...built to give you longer service...priced to save you money. Only with Bronco do you get "featherweight" aluminum construction that will withstand the toughest shocks and impacts combined with the exclusive Bronco bonding process that prevents tire separation. For every industrial purpose, Bronco Wheels will give you more miles for your money.

#### SPECIAL SERVICE WHEELS

In addition to the wide range of standard Bronco spoke or disc wheels, the Bronco line includes Special Service Wheels with tread and bearings to meet specific conditions.



Write today for illustrated brochure showing the full line of Bronco Wheels and Bearings.

BRONCO PRODUCTS CO., 717 Stanford Ave., Los Angeles 21, Calif.

**OHIO**  
*Industrial Trucks & Trailers*



NO. 1001

Capacity 20000 lbs.

Size 48" wide x 96" long x 22" high. All welded steel construction with Pressed-On Rubber Tires and Plate Steel Deck. An all purpose heavy duty industrial trailer.

Various Platform Sizes may be furnished.

Heavy Duty Trucks and Trailers to YOUR Specifications. Write for Detailed Information.

THE OHIO GALVANIZING & MFG. CO.  
MILES • • Established 1902 • • OHIO

Circle 118 on Reader Service Card for more information  
160

## NEW EQUIPMENT SECTION

### Easy Lifting and Dumping



A new line of PowRdumpers has been introduced by Langley Mfg. Co., Inc. Dumping capacities of the three new basic models range from 750- to more than 2000-pounds. PowRdumpers raise drums, barrels, bags, boxes, or any type container, turn to any desired dumping angle, and discharge the contents without spillage. Any cycling can be furnished from complete control by operator to complete automatic control by machine.

Circle 289 for more information

### Hand Numbering Device

The Stampmaster is recommended by Noble & Westbrook Mfg. Co. for use in industry for random or selective numbering on all types of products where a permanent legible impression is applied by hand. Part numbers, heat code numbers and similar identifying data can be set up quickly and easily by indexing individual wheels. The head is small and compact and is said to be ideal for carrying to the work when it is not practical to bring the work to the tool. It is available in 3/32-inch and 1/8-inch character sizes with additional sizes to be introduced at a later date. Heads are available in various wheel capacities.

Circle 290 for more information

### Versatile Portable Bag Closer



An improved model of the Fischbein Portable Bag Closer is said to accommodate virtually every bag in use by industry. It will close the lightest or the heaviest paper or textile bag, whether asphalt treated or specially processed, with no change in parts or adjustments claims Dave Fischbein Co. The machine is electrically powered by a 1/2-hp motor and weighs 10½ pounds, including full cone of thread.

Circle 291 for more information

### Standard Stereoplate Conveyor

A standard design of unit sections which may be economically combined to form a versatile conveyor system for stereoplates is available from Wiretyer Corporation. All elements are power driven and de-

FLOW

signed for reversible operation. The basic conveyor is a dual drag-chain construction which fits within a four inch floor depth. Curved sections utilize a direct power drive to each drag-chain to obtain positive control of the stereoplate. All incline sections incorporate lugs to prevent slippage of the plate.

Circle 292 for more information

### For Gases and Liquids

A new line of cylinder operated solenoid pilot controlled valves for handling most corrosive gases and liquids is available from Automatic Switch Co. Flexibility in construction permits free choice of body materials to suit the fluid controlled. Standard, watertight or explosion-proof solenoid enclosures can be provided.

Circle 293 for more information

### Fast Cable Hoist



Lifting speeds up to 25 fpm are available in the Model 55 electric cable hoist manufactured by David Round & Son, Inc. Fully enclosed, the compactness of the unit's design is said to achieve exceptionally close headroom for electric hoist construction. The hoist is push-button controlled, and is available in capacities ranging from  $\frac{1}{4}$ -ton to one-ton.

Circle 294 for more information

### Packets Preserve Freshness

Packets of activated carbon and silica gel, developed by Gordon Foods, Inc., to preserve freshness in packaged potato chips, are now being marketed to food and drug manufacturers. Called Magic-Paks, the packets are two-inch perforated envelopes made of cellophane and glassine. They contain a granular mixture of activated carbon and silica gel. Repeated tests have shown that sealing one packet inside a potato chip bag is an effective means of extending freshness and crispness of the chips for up to two weeks.

Circle 295 for more information

### Easily Installed Conveyor

A new line of Install-Your-Own pre-engineered conveyor systems has been introduced by Lamson Corporation. Light-duty wheel gravity, medium and heavy-duty roller gravity conveyor sections in all standard widths are available, plus a center drive and take-up unit. Other components include unit boosters, vertical and horizontal curves; tail end take-up units and a variety of supports.

Circle 296 for more information

Circle 107 on Reader Service Card for more information

### YOUR BEST MOVE IS TO MOVE WITH MERRILL MATERIAL HANDLING DEVICES



For Interesting Information write

### MERRILL BROTHERS

56-74 ARNOLD AVE., MASPETH, N. Y.

3-2-5



### HEAVY DUTY FORK LIFT TRUCK FOR PAVED OR UNPAVED AREAS

Lowers handling costs—Easily handles bulky or heavy loads (up to 5000 lbs.)—11" under-clearance and super traction permits operation where others cannot. 10' tower telescopes to 98 $\frac{1}{2}$ "; Power tilt forward 4°, backward 10°; 5 forward speeds, 1 reverse; Road Speed 20 M.P.H. Excellent visibility. Easy operation with power steering, hydraulic operated clutch and brakes.

Service and parts for chassis available at International Harvester Dealers throughout U. S.

Complete line of optional equipment available.

We also manufacture Trac-Lift Models 20L, 20 and 40 with 2000 to 4000 lbs. capacity.

*Write or phone for complete information*

Dept. F,

**PIPER and PAINE** Nunda, New York

Circle 167 on Reader Service Card for more information

Circle 145 on Reader Service Card for more information

## YES! You CAN build your own STORAGE RACKS

AT  
LOW COST



WITH

## TUBE STRUT

CLAMPS

A strong and economical rack with  
TUBE-STRUT clamps and your own  
pipe. Write for details.

TUBE-STRUT DIVISION  
TUBULAR STRUCTURES CORP. OF AMERICA  
3129 RIVERSIDE DRIVE  
LOS ANGELES 27, CALIFORNIA

Speed up order picking and storage

## JAKES SAFE-TOW CONVEYOR TRUCK

Saves valuable man hours  
in any warehouse



Easy rolling, rigid, one-man truck with  
quick connecting attachments for over-  
head or in-floor conveyors. Various  
platform sizes and capacities (2000 to  
4000 lbs.). Rubber-tired or plastic  
wheels . . . any size you need. Steel or  
hardwood deck. Trailer couplings  
available.

WRITE, WIRE, OR CALL  
FOR FULL INFORMATION

MODEL TT-18

## JAKES FOUNDRY COMPANY

Established 1891

2800 Charlotte Avenue

Nashville 9, Tennessee

Circle 75 on Reader Service Card for more information

162

## NEW EQUIPMENT SECTION

### Drum Handler

The Miller Drum Handler manufactured by General Machine & Welding Works, Inc. is designed for attachment to fork trucks. The unit is said to speed operation as much as 75 per cent, eliminate damaged drums and increase safety. It is controlled from driver's position by a hand lever and can handle from one to four drums.

Circle 297 for more information

### Tool and Supply Car



Capacity of this new tool and supply car is 2000 pounds. Constructed of all-tubular high-carbon steel, it is designed to safely carry heavy loads of ties, rails, supplies and tools. Platform size is 48 by 45 inches; height above rails 8 inches. It breaks in the center for easy handling and transportation. Manufacturer is The Nolan Company.

Circle 298 for more information

### Easy Slate Handling

A newly designed pallet for slate utilizes the product itself as vertical end supports against which the material is tightly stacked on end and securely locked in place. This is accomplished by slots at the ends of the pallet. Slab products cannot shift or slide off pallet during loading, transporting or storing, it is claimed. Light weight, low cost and durability are pointed out by the manufacturer, Tatko Brothers Slate Co., Inc.

Circle 299 for more information

### Stair Climbing Hand Truck



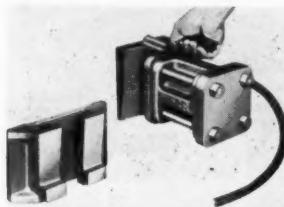
Valley Craft Products, Inc. has introduced a new model stair climbing hand truck designed to greatly reduce the work involved in delivery of all types of appliances. Called Model 400, the truck is equipped with a special ratchet mechanism which enables it to roll up stairs step by step as the operator

pulls a drive cable. Two wheel safety brakes permit perfect control of load. Other features are a belt reel, skid rails, padded frame, pneumatic tires.

Circle 300 for more information

FLOW

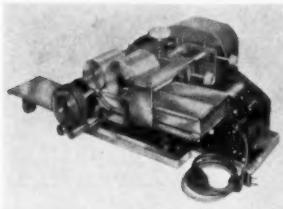
## Portable Heavy-Duty Vibrator



This lightweight, portable vibrator is termed Type LSRRH and is said to be unusually well-balanced and ideal for heavy-duty use on portable bins, trucks, concrete forms, etc. Develops 7000 to 8000 vibrations per minute at maximum efficiency. Available from Cleveland Vibrator Company.

Circle 301 for more information

## Margin Gluer

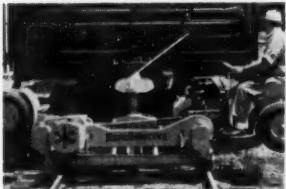


Topside margin gluing machine said to be ideally suited for mass production set-ups because it delivers work coated side up. Identified as the Model TMG, it can be mounted over a conveyor so

that the coated material is carried along for further processing or for drying. Because it is applied to the topside of material, operators can readily inspect the coating. The machine handles all types of liquid glues including latex. Manufacturer is Potdevin Machine Co.

Circle 302 for more information

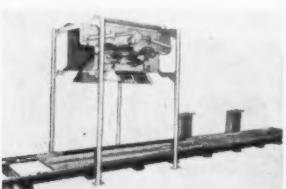
## Roadable Rail Switcher



This roadable type rail car switcher utilizes the box cars' weight, through weight transfer, to obtain traction. Offered by Hemco Manufacturing, Inc. and called Hemco-Motive, the unit is equipped with a positive coupler and fluid drive. Drawbar pull is 7400 pounds.

Circle 303 for more information

## Coal Handler



Coal can be handled more efficiently through use of the Automatic Loading Station claims The Nolan Company. Unit features hydraulically operated fly gate and hopper. In operation, full automatic hydraulic control is interlocked with a PortaFeeder. Loading Bar protects against over-filling either the unit being loaded or the on-coming empty.

Circle 304 for more information

Circle No. 83 on Reader Service Card for more information

You can provide easy mobility to a variety of industrial products with

## IRONBOUND ALL-PURPOSE HANDLING UNITS . . .

### POPULAR IRONBOUND



An easy to handle ruggedly constructed unit for carrying bulky and heavy loads at lowest cost. Seven standard sizes with one or two push handles makes it easy to select the proper truck for your requirements. Ask an Ironbound engineer for suggestions.



The HANDY  
for furniture and similar items.

The HAULER  
for cases, crates, tote boxes, etc.

The HUSKY  
for general use throughout the plant.

### THE IRONBOUND "SAFETY-SKID" WITH ROUND CORNERS

Ironbound construction assures long hard use with complete safety to product and operator. Still the time proven method for handling of materials efficiently and economically.



## IRONBOUND

BOX & LUMBER COMPANY  
Materials Handling Division

30 HOFFMAN PLACE • HILLSIDE, N. J.

MANUFACTURERS OF QUALITY BUILT SKIDS, SEMI-LIVE SKIDS, FLOOR TRUCKS, ROLL TRUCKS, DOLLIES AND PRY BARS

## HERE'S HELP!



CATALOG SHOWS  
HOW YOU CAN  
**CUT COSTS**  
and solve handling  
problems with

**Hapman**  
**TUBULAR**  
**CONVEYORS**  
for wet or dry  
bulk flowable  
materials

—metal chips—chemicals—foods

A fact-packed catalog—shows application and advantages of Hapman Chain-Flight Tubular Conveyors.

REQUEST YOUR COPY OF CATALOG F-125

Details of new metal-belt PAN-LINK Conveyor for bulk chips, turnings, broken glass, etc., available on request.



**Hapman CONVEYORS, INC.**  
DIVISION HAPMAN-DUTTON COMPANY

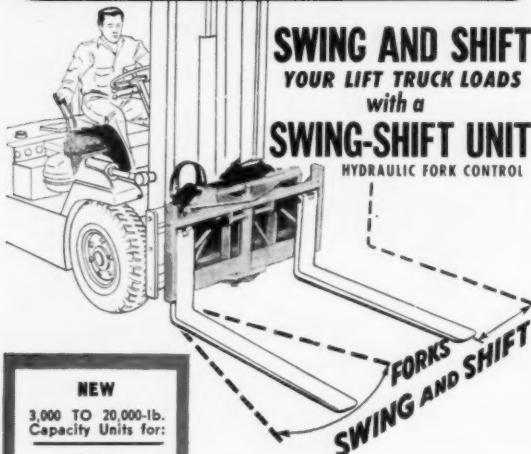
KALAMAZOO MICHIGAN

In British Commonwealth & Europe: Fisher and Ludlow Ltd., Birmingham

Circle 74 on Reader Service Card for more information

Circle 136 on Reader Service Card for more information

**REDUCE OPERATING COSTS up to 10%**



**NEW**  
3,000 TO 20,000-lb.  
Capacity Units for:

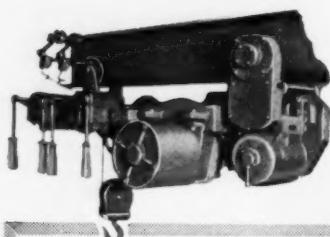
**BUDA  
CLARK  
GERLINGER  
HYSTER  
YALE & TOWNE  
ROSS  
BULL MOOSE**  
(Canadian  
Mobile)

See your lift truck  
Dealer or Write:

**SAVE TIME**—Swing and Shift the load to eliminate non-productive truck maneuvering.  
**SAVE SPACE**—Swing and Shift the load instead of the truck in tight areas—use less aisle width.  
**REDUCE COSTS**—Swing and Shift up to 14% more loads per day—speed carloading.  
**WITH SAFETY**—Swing and Shift loads into precision alignment—stack higher, faster, safer.

**SWING-SHIFT MFG. CO.**  
P.O. BOX 957  
LONGVIEW, WASHINGTON

**time-saving...  
manpower-saving**



**ELECTROLIFT  
WORM  
DRIVE  
HOIST**

One man can handle up to six tons quickly and safely with an ElectroLift Worm Drive Hoist. A dependable, long-lasting ElectroLift Hoist pays for itself many times over, with savings in time,

power and labor. Available in a wide variety of models—trolley drive or manually operated.

For full details call your ElectroLift representative listed in the telephone directory.

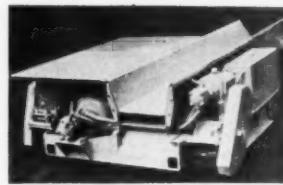
**ELECTROLIFT**  
WORM DRIVE  
HOISTS

**ELECTROLIFT, INC., 204 Sergeant Ave., Clifton, N.J.**  
Circle No. 51 on Reader Service Card for more information

164

## NEW EQUIPMENT SECTION

### Speeds Mining Operations



The Model 500 mobile conveyor head with crawler drive is said by the Cone-Drive Gears Div. of Michigan Tool Co. to provide considerable savings in installations where frequent moves are required. Two standard four inch center distance double-enveloping worm gear speed reducers are incorporated in the crawler drive to provide a high load-carrying capacity in the compact unit. Reduction ratio is 30:1; input speed 850 rpm.

Circle 305 for more information

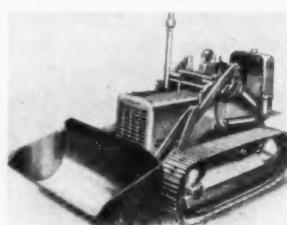
### Colored Plastic Coatings



dipping, is removed by stripping.

Circle 306 for more information

### New Tractor-Shovel



Incorporated in the No. 955 Traxcavator manufactured by Caterpillar Tractor Co. are the advantages of integral tractor and shovel design. The unit utilizes a 1½ cubic yard bucket, which may be tilted in any position, and features an improved seat location for operator comfort and visibility.

Circle 307 for more information

### Plastic Coated Steel Tape



Met-L-Tape is basically a high tensile steel strap over which vinyl, nylon or polyethylene plastic has been extruded. The plastic forms a thick coating which protects the met-

FLOW

al from corrosion. Advantages claimed for the tape by The Garrison Co. are: It combines strength of steel with the dielectric properties, abrasion resistance and other service factors of plastic coatings; It can be fastened by bolts or rivets, or, by stripping a section of the plastic to expose the metal, it can be spot welded. Coatings are available in any color and can be heat sealed at the cut ends.

Circle 308 for more information

### Self-Propelled Shovel-Crane



Available from Schield Bantam Company is this new self-propelled  $\frac{3}{8}$  cubic yard, six-ton shovel-crane, designated Bantam CR-35. Lifting capacity is 12,000 pounds and outside turning radius  $19\frac{1}{2}$  feet. It features extreme maneuverability and what is claimed to be the shortest self-propelled turning radius in the shovel-crane industry. Two-speed independent travel allows the operator to work the upper deck machinery and travel at the same time. The newly designed all-vision cab gives the operator 360 degree visibility at all times.

Circle 309 for more information

### Furniture Rack Saves Storage Space

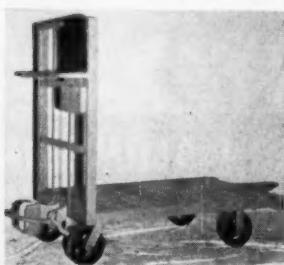


Arteco Corporation has added a new type of furniture rack to its Rak-A-Tier line of storage systems. Furniture is stored on open platforms that are cantilevered on both sides of center uprights. Absence of uprights on the aisle is said to give

more prompt and ready access to storage areas and the furniture itself, making loading and selection easier, faster and more economical. Adjustable, grooved channels hold furniture legs, and channels slant downward toward the aisle. Any length rack is available.

Circle 310 for more information

### Industrial Trailer Answers Need



Jakes Foundry Company has developed a light duty industrial trailer which is particularly suitable to the motor truck industry and use with the newly designed medium duty tractors. Standard deck size is 32' by 48-inches with a deck height of



THE kangaroo has a real handling problem . . . but Nature gave it the jump on its neighbors with a handy carrying pouch, built for the job. And you can get the jump on your materials handling problems by specifying Bond built-for-the-job Casters. For dependability, economy and trouble-free service, your best buy is Bond!

See your industrial distributor—he has the right Bond Casters built-for-your-jobs.

**BOND FOUNDRY & MACHINE CO.**  
Manheim, Pa.

36-A Series  
—Double Ball Race Swivel Caster



3-A Series  
—Single Ball Race Swivel Caster

1-A Series  
—Stationary Caster



Write today for new 24-page Lansing Floor Truck Catalog

**THE LANSING COMPANY**  
LANSING, MICH.

Circle No. 43 on Reader Service Card for more information



Photo taken in Cost Dept., Becton, Dickinson & Co., Rutherford, N. J.

### DENOMINATOR Saves 50% Clerical Analysis Time on Production Inspection Reject Reports

Becton, Dickinson & Co., manufacturers of high quality surgical instruments, take exceptional care in the production of their products. For example, inspection tickets—attached to all batches of glass syringe parts—list 20 possible reasons for rejection. Record of actual rejects is made as these tickets move with the work.

Weekly analysis of over 3000 reject tickets formerly required two operators—now only one operator is required, using a 20 unit Denominator!



What's your sort-and-count problem? For free illustrated brochure write Dept. FM-56

The DENOMINATOR COMPANY, Inc.

261 BROADWAY, NEW YORK 7, N. Y.

Manufacturers of Tabulating Machines for 40 years

The trucks that  
last a lifetime  
... by HOWE



HOWE — knows how — has designed trucks for industry since 1857. Outstanding features include heavy duty, all-welded, one piece, steel frame; roller bearings in all wheels, plate type, double-row swivel casters — on all HOWE standard and special purpose trucks.

TRUCK DIVISION

The HOWE SCALE Co.

INCORPORATED  
Rutland, Vt.

Famous FIRST in '57

Send more information  
about the Howe truck  
line to

NAME \_\_\_\_\_ TITLE \_\_\_\_\_  
COMPANY \_\_\_\_\_  
STREET \_\_\_\_\_  
CITY or TOWN \_\_\_\_\_ STATE \_\_\_\_\_

Circle 79 on Reader Service Card for more information  
166

## NEW EQUIPMENT SECTION

approximately 11 inches. The trailer has a blackboard, bill holder and push handle for manual operation. Designated Model TT2-1500, capacities range from 2000- to 3000-pounds.

Circle 311 for more information

### Higher Power Output



2-7/8" bore by 2-3/4" stroke provides a displacement of 17.8 cubic inches.

Circle 312 for more information

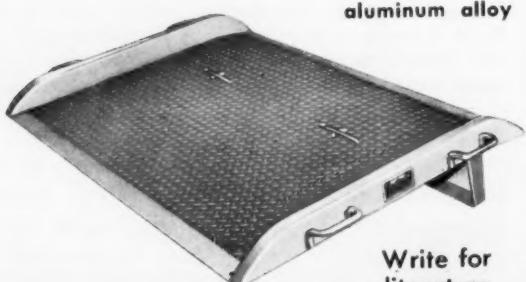
New engineering features that result in a higher power output per cubic inch of piston displacement have been incorporated in the Model BKN air-cooled engine by Wisconsin Motor Corporation. The engine is rated from 3.2 to 6.8 hp in a speed range of 1600 to 3600 rpm. Its

2-7/8" bore by 2-3/4" stroke provides a displacement of 17.8 cubic inches.

## W-A-C-O ALUMINUM DOCK BOARDS and YARD RAMPS

- Standard sizes and custom fabricated
- Constructed of strong, lightweight

aluminum alloy



Write for literature

WASHINGTON ALUMINUM COMPANY, INCORPORATED  
BALTIMORE 29, MARYLAND • ARBUTUS 2700

New York Office—MU. 7-0926

Circle 158 on Reader Service Card for more information  
FLOW

**Narrow Cart**

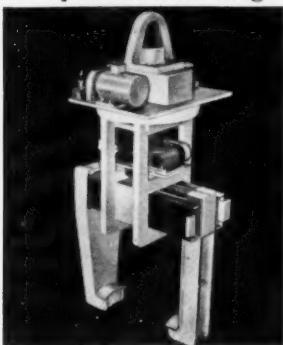
This new six cubic foot heavy duty cart is built especially narrow to allow passage through an ordinary door opening. Tray is of 12 gauge steel, completely welded and reinforced at top edge with  $\frac{3}{8}$ " x  $1\frac{1}{2}$ " steel bar. Channel steel legs are equipped with shoes as added support. Tubular handles are reinforced against breakage and bent for easy dumping. Available from Sterling Wheelbarrow Co. with steel or pneumatic-tired wheels.

Circle 313 for more information

**Expendable Pallets**

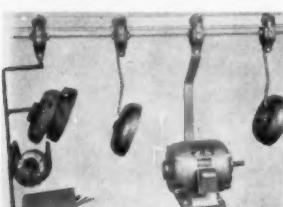
R. S. Swartzman Company has developed an expendable pallet which consists of paper tube legs fastened with metal to a paper board deck. Called the Trico pallet, it can be made to any height and size.

Circle 314 for more information

**Heavy Coil Handling**

Horizontal handling of heavy coils that vary in width can be accomplished with the new Model G-1608-25MA grab in a minimum aisle space. Pick-up and release are motor operated, with remote control in the crane cab or by the floor man. The grab, made by Mansaver Industries, Inc., is available with or without the turntable.

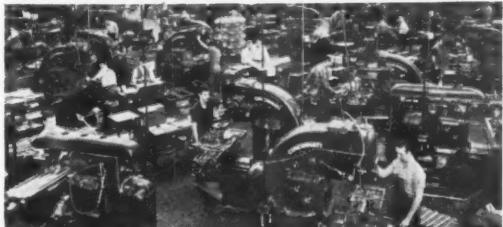
Circle 315 for more information

**Easily Installed Cable Conveyor**

Cable-type conveyor systems capable of handling up to 250 pounds per hanger are available from Tipp Manufacturing Co. The continuous conveyor track is prefabricated  $2 \times 2 \times \frac{1}{4}$ " T-rail, with all-bolted construction. Support rods and mounting brackets, which are bolted to the track during assembly, are furnished. Electric drive is available with fixed or variable speeds, and track is available for inclines, vertical bends, quick-dip bends and straight runs.

Circle 316 for more information

*To be sure!* YOU CAN GET BETTER PRODUCTION IN YOUR PLANT

**TIME RECORDER-TOTALIZER**

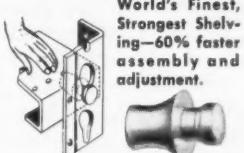
PRICE \$55.

• This precision instrument provides accurate, permanent, chronological data about any machine, process or system in plant or office ... on a continuous chart-roll which lasts four months. Uses no ink. Totalizer shows accumulated "on" time.

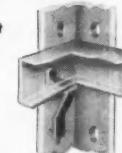
descriptive literature FL on request

**STANDARD INSTRUMENT CORPORATION DIV.  
HEAT-TIMER corporation  
657 BROADWAY, NEW YORK 12, N.Y.**

# NOW! 4 TYPES OF EQUIPTO SHELVING

**IRON GRIP STUD**

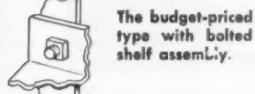
World's Finest, Strongest Shelving—60% faster assembly and adjustment.

**CLIP**

Permits instant adjustment of shelves with flanges up or down.

**SLIDING SHELF**

Features shelves that slide in and out like drawers.

**NUT & BOLT**

The budget-priced type with bolted shelf assembly.

**Equipto**

TELL ME MORE ABOUT FOLLOWING TYPE:

<input type="checkbox"/> stud	<input type="checkbox"/> sliding shelf	<input type="checkbox"/> clip	<input type="checkbox"/> bolt and nut
<input type="checkbox"/> Have Layout Engineer Call			

NAME \_\_\_\_\_

FIRM \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_

CLIP AND MAIL COUPON FOR FULL FACTS

Division of Aurora Equipment Co.  
805 Prairie Avenue • Aurora, Ill.

ZONE STATE \_\_\_\_\_

MADE OF MAGNESIUM

## PUSHAROUNDS Cut Handling Costs Make Work Easier!



PUSHAROUND  
SHELF  
TRUCK

for industrial or department store applications. 500 or 1200 lbs. capacity.

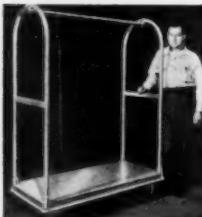
Made of MAGNESIUM, Pusharounds handling equipment has the strength of steel but weighs only  $\frac{1}{3}$  as much! Designed for ease of handling, long service life and minimum maintenance, Pusharounds carry more with less dead weight—costs less to own and operate in the long run. Write for the facts today!

NEW PUSH-  
AROUND HAND  
TRUCK. Handles up to 450  
lbs. with minimum weight.



### Many Models for Department Stores:

Garment trucks, transfer trucks, shelf trucks and many other standard models.



PUSHAROUND  
GARMENT  
TRUCK

Inspection, marking, storage and handling—all in one lightweight operation.

### WRITE TODAY

for Pusharounds File Folder

BROOKS & PERKINS, INC.  
1944 West Fort St. • Detroit 16, Mich.

Distributors in Principal Cities

# Pusharound

magnesium handling equipment

Circle No. 23 on Reader Service Card  
168

## CLASSIFIED ADVERTISING

Rates: for "Positions Wanted" \$8.00 minimum, limit 25 words. For all other classifications \$10.00 minimum for 25 words; each additional word 25c. Boldface type or all caps, \$12.00 minimum for 25 words, each additional word 35c. Box address counts as five words. All insertions payable in advance.

### LINES WANTED

Northern New Jersey Manufacturers Agent wants lines for aggressive promotion in that area. Write, c/o FLOW, Box 12255.

### HELP WANTED

Young materials handling engineer for plant in south. In reply, please state full personal particulars, industrial background and salary requirements. Write c/o FLOW, Box 12355.

**MATERIALS HANDLING**—Prominent glass container manufacturer seeks man with thorough background in materials handling field. Position requires servicing of customer accounts in the development, analysis, and administration of materials handling programs. Intra-company responsibilities will involve surveys relative to cost reduction and standardization of procedures. Excellent career opportunity with expanding company in New York State. For further information or interview arrangements, write c/o FLOW, Box 12455.

Engineer—5-10 years experience in engineering, construction and process design. Must be capable of directing all phases of engineering design and construction work in connection with ore dressing and chemical processing plants. Southwest USA. Salary open. Write, c/o FLOW, Box 12555.

### FOR SALE

BURT HIGH SPEED CASER  
(MODEL PCS)

ABC TOP & BOTTOM CASE  
SEALER (MODEL XSA)

ABC 16' COMPRESSOR UNIT

We list this equipment to sell because our production schedules force us into a higher speed line. The above equipment has been used to package quart cans of anti-freeze, operating only six months each season. Equipment is five years old and in excellent condition. Priced to move quickly.

STREETT INDUSTRIES, INC.  
Telephone—St. Louis, Mo., TW. 2-2958  
Address—P.O. Box 33, Lemay 23, Mo.

### WANTED

2 Late Model  
CLARK ELECTRIC  
FORK LIFT TRUCKS

2,000 lb. Capacity

(May consider other makes)

Write c/o FLOW, Box 12155

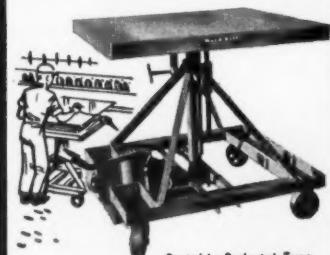
take the back-breaking  
**LIFT**  
out of the Heavy Jobs...  
WITH

## Weld-Bilt

### HYDRAULIC LIFT TABLES



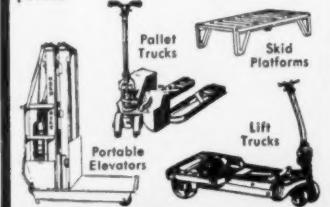
Heavy Duty Table with Electric  
or Manual Control



Portable Pedestal Type  
for loads to 2000 lbs.

You don't need "muscle-men" for handling heavy dies, sheet steel, or big machined parts, when you have new WELD-BILT Hydraulic Tables on the job. Just adjust the Table to loading height, slide parts on easily, without tugging or lifting. Then just move to press or machine position, raise or lower to working height—fast, easily.

Heavy duty WELD-BILT Hydraulic Lift Tables, with foot pedal and push button, or foot pump control, handle loads up to 10 tons. Portable Pedestal type Tables handle loads up to 2000 lbs. Write for latest bulletin and prices.



## WEST BEND EQUIPMENT CORPORATION

Materials Handling Engineers

335 Water Street, West Bend, Wis.  
Circle No. 157 on Reader Service Card  
FLOW



Cook and Rathborne on  
Chicago lake front  
(about 1880).

## Box Company Celebrates Centennial

In observance of its centennial this year, the Rathborne Hair and Ridgeway Box Co. has published its "100 Year Story" a colorful volume describing the firm's growth from a small planing mill and box factory. The early history of the company, dating back to scarcely two years after the United States had attained its present continental territorial limits, included a series of involved partnerships, mergers and family alliances.

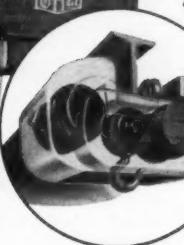
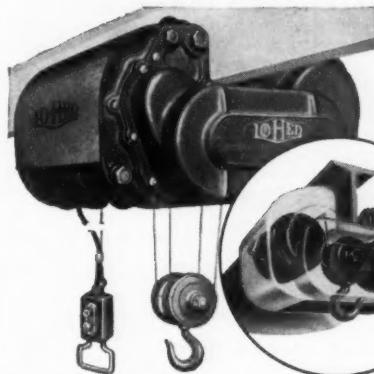
The company attained its final form under the name Rathborne, Hair and Ridgway only in 1893. At that time, the Hair and Ridgway interest was joined by the Chicago lumber firm of Cook and Rathborne which shipped choice pine from Michigan and Wisconsin to all parts of the United States. According to "The History of Chicago" by Andreas published in 1886, Cook and Rathborne was operating a large planing mill and box factory. After the turn of the century the management of the firm inaugurated a far-reaching expansion program.

Realizing the potential of the shipping container industry, the company established numerous saw mills and wooden box plants throughout the great timber lands of Wisconsin and Minnesota. To aid expansion in the corrugated field, the Dearborn Paper Products Co. was purchased in 1933.

# Materials handling is easier, cheaper, with **LO-HED HOISTS**

## WHICH TYPE OF LO-HED IS BEST FOR YOU?

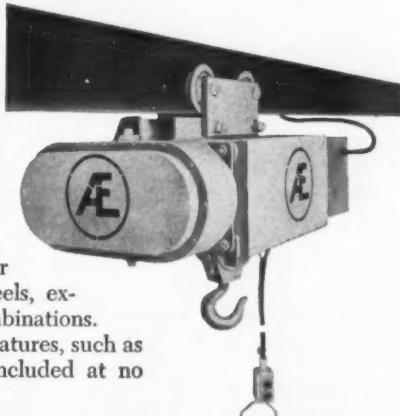
### HERE'S THE FAMOUS CUSTOMIZED LO-HED



Available in a range of capacities from  $\frac{1}{4}$  ton to 12 tons... and five suspension types... Customized Lo-Hed is feature-packed for operational speed, safety and economy. Its design provides low headroom. It's built for longer service life. The bottom block is shrouded. The hook, on an oil-impregnated bearing, prevents fouled lines. On a-c installations a transformer puts only 110 volts at the push-button. And all these extra advantages are yours at no extra cost... Talk over with your local Lo-Hed representative the adaptability of Customized Lo-Hed for your special requirements.

### AND HERE'S THE PACE-SETTING STANDARD LO-HED

Standard Lo-Hed, as you've heard, is the sensation of the heavy duty hoist field. Available in 2 and 3 ton capacities, it's truly a standard hoist; quantity-produced and ready for shipment from stock. The last word in modern engineering and materials, its welded steel chassis combines light weight and rigidity. Its straight line spur gear drive eliminates worm-wheels, extended shafts and split gear combinations. Its price is right, too, and extra features, such as lower limit safety switch, are included at no extra cost.



Write for literature describing either the Customized Lo-Hed or the Standard Lo-Hed, or both. Lo-Hed Hoists are cutting material handling costs in plants from coast to coast. American Engineering Company, 0000 Aramingo Ave., Philadelphia 25, Pa.

# AMERICAN ENGINEERING

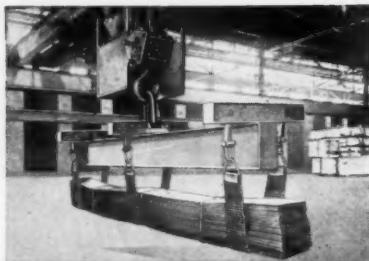
COMPANY

Philadelphia 25, Penna.

Affiliated Engineering Corporations, Ltd., Montreal 16, P. Q.  
Bawden Industries Ltd., Toronto 3, Ont.

AE Products are: Marine Deck Auxiliaries, Hele-Shaw and Hydramite Fluid Power,  
Lo-Hed Hoists, Lo-Hed Car Pullers, Taylor, Perfect Spread and Vibra-Grate Stokes.

Circle No. 5 on Reader Service Card for further information



## GRIPPER

WOVEN WIRE

## SLINGS

**GRIP BETTER • LAST LONGER  
REDUCE LOAD DAMAGE  
INCREASE SAFETY**

**GRIP BETTER**—Gripper Woven Wire Slings are completely flexible . . . grip better because they wrap all around your load and provide an extra broad bearing surface, in either BASKET or CHOKE HITCH.

**LAST LONGER**—All-Metal construction means long life, freedom from damage even by sharp edged loads. Special alloys are available for use where high resistance to corrosion or heat is required.

**REDUCE LOAD DAMAGE**—The flat bearing surface will not cut into or score material being handled because Gripper Slings bend across their width. Better grip prevents shifting of the load.

**INCREASE SAFETY**—Gripper Slings will not kink or tangle . . . loose ends do not cause dangerous whipping or snarling. Smooth woven wire construction eliminates sharp loose strands. Every sling PRETESTED to meet loading specifications.

**GRIPPER Woven Wire SLINGS** are available in standard lengths and widths . . . and capacities up to 100,000 lbs. Special sizes on request. See your materials handling, mill supply or safety equipment distributor. OR, write direct for FREE catalog and name of nearest distributor.



### The Cambridge Wire Cloth Co.

Dept. W • Cambridge 12, Md.



DISTRIBUTORS—write for open territory data!

Circle No. 29 on Reader Service Card  
170

# Index Of Advertisers

Ackermann Mfg. Co.	25	Gaylord Container Corp.	106
Acme Steel Co.	50	General Box Co.	119
American Chain and Cable Co., Inc.		General Electric Co.	52
Wright Hoist Div.	21	Gerotor May Co.	128
American Engineering Co.	169	Gerrard Steel Strapping Div., U. S. Steel Corp.	111
American Machine & Foundry Co.	129	Gifford-Wood Co.	44
American Monorail Co.	134	Globe Hoist Co.	17
American Sisalkraft Co.	115	B. F. Goodrich Co.	47
American Steel & Wire Div. U. S. Steel Corp., Cyclone Fence Dept.	146	Goodyear Tire & Rubber Co.	3
American Steel and Iron Works	143	Adolph Gottscho Inc.	122
Anthony Co.	131	Gould-National Batteries, Inc.	42
Applied Hydraulics	26		
Ashworth Bros., Inc.	154		
Autoette, Inc.	138		
Automatic Transportation Co.	1		
		Hapman Conveyors, Inc.	163
Baker-Raulang Co.	20, 58	Heat-Timer Corp.	167
Barrett-Cravens Co.	127	Hercules Motors Corp.	125
Bigelow-Garvey Lumber Co.	116	John W. Hobbs Corp.	158
Big Joe Mfg. Co.	4	Frank G. Hough Co.	39
Bound Foundry & Machine Co.	165	Howe Scale Co.	166
Bostitch, Inc.	107	Hyster Co.	13
Bowers Battery & Spark Plug Co.	144		
Bronco Products Co.	160		
Brooks & Perkins, Inc.	168		
Buda Co.	27		
Buffalo Weaving & Belting Co.	139		
E. W. Buschman Co.	92		
Cambridge Wire Cloth Co.	170	Jakes Foundry Co.	162
Capco	116	Joy Mfg. Co.	56
Cesco Container Co.	146	Joyce-Cridland Co.	145
Chrysler Corp. Industrial Engine Div.	45		
Clark Equipment Co.	10 & 11	Keller Tool Div., Gardner-Denver Co.	155
Colson Corp.	Inside Back Cover	Kimberly-Clark Corp.	98
Conco Engineering Works	156		
Continental Can Co.	109		
Cullen-Friestd Co.	171		
		Lahe Mustang Mfg. Co., Inc.	22
Darnell Corp.	46	Lamson Corp.	94
Dazzo Products Co.	120	Lamson Mobilift Corp.	95
Deluxe Metal Products	154	Lendahl Conveyor Co.	135
Denominator Co.	166	Lansing Co.	165
Derby Sealers, Inc.	116	Lee Engineering Co.	
Detroit Hoist & Machine Co.	150	Presto Products Div.	29
Diagraph-Bradley Industries, Inc.	122	G. B. Lewis Co.	130
Diamond Chain Co., Inc.	8	Lewis-Shepard Co.	31
Chas. Wm. Doepe Mfg. Co., Inc.	159	Louden Machinery Co.	43
Easiquip Co.	157	Magline, Inc.	Inside Front Cover
Electrolift, Inc.	164	Magnesium Co. of America	19
Elwell Parker Co.	7	Manning, Maxwell & Moore, Inc.	172
Equipment Mfg. Co.	14	Martin-Decker Corp.	149
Equipto Div., Aurora Equipment Co.	167	Mathews Conveyor Co.	137
Euclid Crane & Hoist Co.	148	May-Fran Engineering Inc.	153
Evans Products Co.	117	Mercury Mfg. Co.	96 & 97
Exide Industrial Div., The Electric Storage Battery Co.	38	Merrill Bros.	161
		Minnesota Mining & Mfg. Co.	101
Fibre Specialty Div.		John Morrell Mfg. Co.	35
National Vulcanized Fibre Co.	132	Moto-Truc Co.	15
Field Engineering Products Co.	172		
FLOW Directory	28, 142, 152, 156		
Neff & Fry Co.	159		
New London Engineering Co.	148		
Nolan Co.	150		
Notat Tire Co.	41		

FLOW

Circle No. 125 on Reader Service Card for more information

## In This Issue

Ohio Galvanizing & Mfg. Co.	160
Omic Ltd.	140
Otis Elevator Co.	9
Pak-Rapid, Inc.	123
Paltier Corp.	6
Penco Metal Products Div. Alan Wood Steel Co.	133
Piper & Paine, Inc.	161
Presto Products Div. Lee Engineering Co.	29
Rack Engineering Co.	24
Raymond Corp.	48 & 49
Revolator Co.	55
Richardson Scale Co.	171
Roura Iron Works, Inc.	46
Service Conveyor Co.	151
Signode Steel Strapping Co.	113
Silent Hoist & Crane Co.	142
Simplicity Engineering Co.	2
Standard Conveyor Co.	124
Stanley Works, Steel Strapping Div.	121
Sten-C-Lab, Inc.	120
Sterling Wheelbarrow Co.	144
Stic-Klip Mfg. Co.	147
Stilson Tool, Inc.	158
Swing-Shift Mfg. Co.	164
G. H. Tennant Co.	12
Thermoid Co.	53
Thew Shovel Co.	23
Thilmay Pulp & Paper Co.	118
Towmotor Corp.	93
Tractomotive Corp.	37
Tubular Structures Corp. of America	162
Union Metal Mfg. Co.	36
Union Special Machine Co.	114
Union Steel Products Co.	16, & 40
Unit Crane & Shovel Co.	18
Vickers, Inc. Div. of Sperry-Rand Corp.	51
Washington Aluminum Co.	166
Weber Addressing Machine Co.	123
West Bend Equip. Corp.	168
Wisconsin Motor Corp.	152
Woodford Mfg. Co.	136
Wright Hoist Div., American Chain & Cable Co. Inc.	21
Yale & Towne Mfg. Co.	57

## VERSATILE BULK FEEDING... from a trickle to a torrent with VELOFEEDER

A mechanical vibrating feeder especially designed for all materials such as sugar, bran, pellets, feeds, chemicals, and grains at lower cost, higher efficiency.

### Here's Why!

**Higher Output**—300 to 50,000 lb./hr. hard granular materials; 300 to 30,000 lb./hr. soft ground materials.

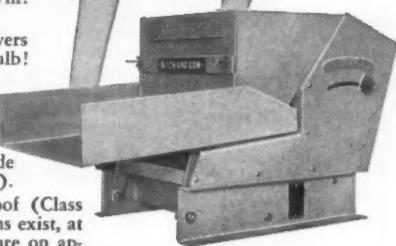
**Lower Power Needs**—1/8 hp. motor powers unit—inexpensive as a 100-watt light bulb!

**Smaller Space Needs**—35 inches long, 17½ inches wide, 19 inches high. Standard vibrating tray 16 inches wide—stainless steel when required.

**Easier Control**—simple adjustment over wide operating range (near 0 to 50 fpm. max.).

**Safer Operation**—motor is explosion-proof (Class 2, Group G), where hazardous conditions exist, at slight extra cost. Complete dust enclosure optional.

**Less Vibration**—working frequency is 1850 vibrations per minute; little or no vibration is transmitted to mounting installation (mounts with only 4 bolts!).



If you're interested in better bulk feeding at lower operating cost, write for Bulletin 5302 with complete specifications and drawing.

© 1952

**Richardson** SCALE COMPANY, Clifton, New Jersey

Atlanta • Boston • Buffalo • Chicago • Detroit • Houston • Memphis • Minneapolis  
New York • Omaha • Philadelphia • Pittsburgh • San Francisco • Wichita • Montreal  
Toronto • Havana • Mexico City • San Juan

MATERIALS HANDLING BY WEIGHT SINCE 1902

**MOTORIZED  
COIL LIFTER  
SAVES  
STORAGE SPACE...  
HANDLES COILS FASTER... SAFER**

*1 Lifter Handles Both Wide  
and Narrow Coils With  
Same Speed and Economy*



This C-F Coil Lifter, under control of the Crane operator handles hundreds of coils a day in a large mill... wide, narrow, and of varying tonnage. Fast, infinite adjustments of the motorized legs permit quick pick-up and set-down. Legs can be opened to any width and held... no need to open to maximum width to handle narrow coil. Maximum of 12" required between coils of any width—saves storage room.

Positive tong grip on coil tightens as lift is made... insures safe handling. Made in motorized models for crane cab or pendant operation as well as manual types with chain wheel, in capacities from 3 tons up. Powered Rotating Heads available. Opening ranges to suit your requirements. Write for Bulletin and complete information.

**CULLEN-FRIESTEDT CO.**

1320 South Kilbourn Avenue • Chicago 23, Illinois

Circle No. 38 on Reader Service Card for more information



Circle No. 60 on Reader Service Card for more information

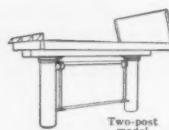
LIFT



Get a LIFT from FIELD...



One-post model



Two-post model

## LOAD-O-MATIC

Effortlessly, smoothly, and quickly, the Field LOAD-O-MATIC automatically lifts loads up to 20,000 lbs. from loading dock to floor of truck, whether truck is above or below dock. The LOAD-O-MATIC drastically cuts loading time. Always working on the level eliminates spilling, prevents accidents. Two models available: two-post for loads 10,000-20,000 lbs.; one-post, under 10,000. LOAD-O-MATIC can be installed at ground level with rear safety barrier to prevent run-off... For details, write for bulletin.

**FIELD ENGINEERING PRODUCTS CO.**  
66 FOOTE AVENUE · JAMESTOWN, N.Y.



## WANT LOWER COSTS? THEN USE THIS HOIST!

Step up load-handling speed and save money doing it. Put the Series "700" "Load Lifter" Electric Hoist to work. It lifts a 1-ton load one foot in only 2 seconds! You get more lifts per hour.

The Series "700" "Load Lifter" is safety-engineered to protect man, load and hoist. Only 24 volts at the push button! The load and motor brakes are synchronized: each, alone, can hold the full load. Steel suspension, overcapacity load hook, pre-formed non-rotating wire rope—all contribute to the super-strength of the "Load Lifter."

The Series "700" "Load Lifter" has few parts. There's extra durability in the heat-treated helical gearing; extra-smooth operation because ball bearings are used throughout. Reliable performance assured! Capacities from  $\frac{1}{2}$  ton up. Single and two-speed control. Let the nearby "Shaw-Box" Distributor show how this rugged hoist can cut your load-handling costs. Or write direct for Bulletin 410.



You'll find answers on what to do about them in this complete safety reference book—Industrial Safety and Health Handbook.

Order your copy now or send for descriptive folder. Price: \$25.



• The Handbook gives you the latest information on all phases of industrial safety. Written in non-technical language, it's a valuable guide to elimination of hundreds of health and safety hazards.

**Industrial Book Co.**

1240 Ontario St.,

Cleveland 13, Ohio



**'Load Lifter'**<sup>®</sup>

**ELECTRIC HOISTS**

**MANNING, MAXWELL & MOORE, INC.  
MUSKEGON, MICHIGAN**

Builders of "Shaw-Box" and "Load Lifter" Cranes, "Budgit" and "Load Lifter" Hoists and other lifting specialties. Makers of "Ashcroft" Gauges, "Hancock" Valves, "Consolidated" Safety and Relief Valves, "American" and "American-Micronen" Industrial Instruments, and Aircraft Products.

Circle No. 102 on Reader Service Card  
**FLOW**

# "Load Floating"

## **COLSON CASTERS**

**...Make Old Equipment  
Roll Like New!**

Here Are a Few of the Nearly 2000 Types of Colson Casters Available for Every Materials-Handling Need



**COLSON**  
ForgeWeld  
Casters

The world's finest caster for extra heavy duty requirements. Wheels of cast steel, iron, rubber, molded plastic—in capacities up to 6000 pounds per caster. Available in swivel and rigid models.



**Medium  
Heavy  
Duty  
Casters**

This series of medium heavy duty casters is precision-engineered to insure long service. Entire ball-bearing assembly constantly runs in a bath of grease. Available as swivel or rigid models in 6" and 8" wheel diameters. Capacity 700 pounds per caster.

**Casters with  
Pipe Thread  
Stems**



For use on heavier types of tubular equipment these casters fit easily into standard  $\frac{1}{2}$ ",  $\frac{3}{4}$ " or 1" pipe. This series available in  $2\frac{1}{2}$ ",  $3\frac{1}{4}$ " and 5" wheel sizes; capacity 200 pounds per caster.

**COLSON**  
PressWeld  
Casters



An improved low-cost caster with hardened raceways, and unbreakable fork and top plate. Ideal for dollies, racks, box trucks and similar applications in the moderate capacity range.

**COLSON**  
Pneumatic Casters



Ideal for handling fragile products over rough, bumpy floors. Semi-pneumatic tires also available. In rigid or swivel models with 6", 8" or 10" tires.

**"V"**  
Groove Wheel  
Casters



Ideal for use on inverted angle iron track in progressive production lines or on hand operated or conveyorized vehicles. Standard wheel diameters 4", 6" and 8"—capacities from 600 to 2500 pounds per caster. Special casters of this type up to 12,500 pound capacity can be engineered to meet your specific requirements.

**Casters with  
Round or  
Square  
Stems**



Especially well suited for use on tray trucks, portable scaffolds, portable tables, etc., these rubber tired casters are available in rigid or swivel models with wheel diameters from 4" to 10" and capacities from 300 to 500 pounds per caster.

Write us or consult the yellow pages of your phone book  
(under "Casters") for the COLSON office near you.

Casters • Hand Trucks • Lift Jack Systems  
Hydraulic, Electric and Mechanical Power Lifts and Transports

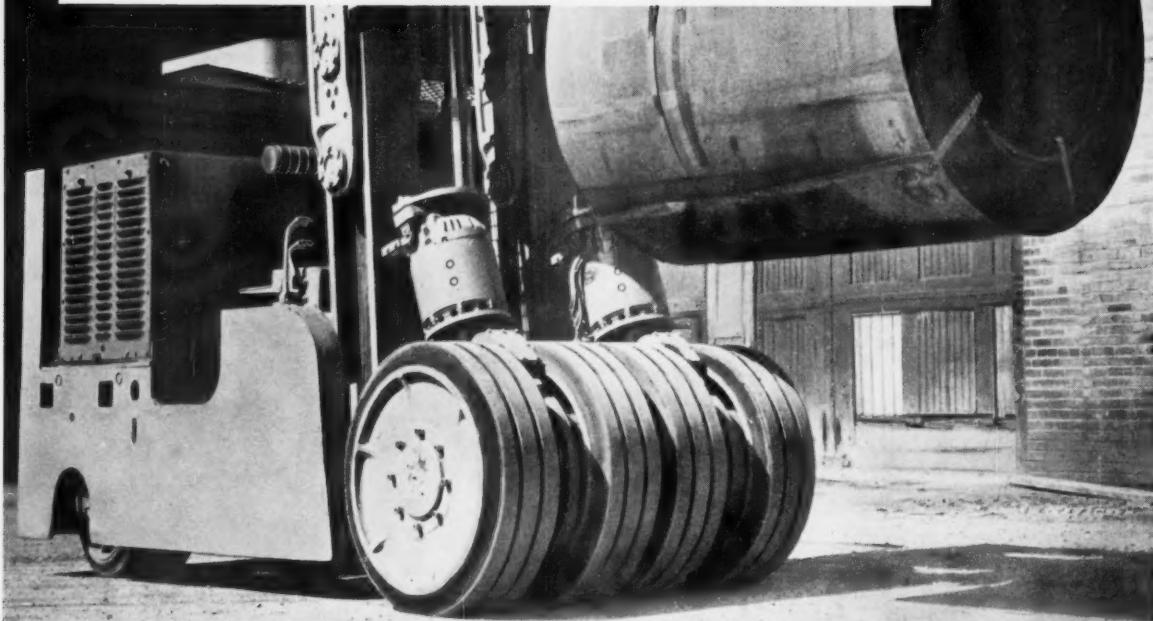
**THE**



**CORPORATION**  
*Elyria, Ohio*

Circle No. 36 on Reader Service Card for more information

## Looking for industrial tires that can really take punishment?



## Get Goodyears — they're Job-Fitted!

THE TRUCK above is a good example of how Goodyear Industrial Tires can stand up under rough wear. Operating on rough outside roads under tremendous loads, these tires take a terrific beating because they are subject to more than the normal amount of cutting and chipping.

So the Goodyear dealer recommended the highly chip-resistant RED SEAL compound for longer life. For oil or grease covered floors Goodyear has an oil-and grease-resisting YELLOW SEAL compound. And that's only one way Goodyear Industrial Tires can be job-fitted to meet a particular need.

For the right kind of cushioning, stability and traction, there are four types of treads in the solid tires alone.

Today, why not ask your Goodyear dealer to recommend the tires that are not only right for your trucks—but right for your jobs. Or write:

Goodyear, Industrial Tire Sales, Akron 16, Ohio

USE THE RIGHT TIRE FOR THE JOB—BUY AND SPECIFY

**GOOD**  **YEAR**  
**INDUSTRIAL TIRES**

All-Service, All-Weather, Xtra Cushion—T. M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

Look for this sign; there's a  
Goodyear dealer near you.



GROOVE TREAD SOLID—  
built to take heavy punishment  
on big trucks

SMOOTH-SOLID—  
for factory, warehouse and  
loading platform

ALL-WEATHER TREAD—  
for ramps, wet surfaces and  
other extra-traction  
conditions

ALL-SERVICE TREAD  
XTRA CUSHION—  
built with compact lug  
design for fast, easy rolling  
with maximum smoothness  
and stability

